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ABSTRACT

This final report describes a project begun in 1962 which was designed to analyze the effect of home and maternal influence on the cognitive development of urban preschool children evaluated when they were four years old. The research group consisted of 163 mother-child pairs from three socioeconomic status levels: middle class, skilled working class, and unskilled working class. Subjects were selected from both father-present and father-absent families. The text of the report establishes empirical baselines and offers concepts and constructs related to family resources and maternal life styles, maternal control strategies and cognitive processes, mother-child interaction, cognitive behavior of mother and child, mother's language and the child's cognitive behavior. A summary chapter highlights project results. Extensive appendixes supplement the text by providing detailed analysis of testing techniques, interview procedures and statistical data. References are included. A follow-up report of academic performance and cognitive attainment during the children's first two years of school is available as PS 003 335. (WY)

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THE COGNITIVE ENVIRONMENTS OF URBAN PRESCHOOL CHILDREN

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PREFACE

This is the final report of a project begun in 1962 designed to analyze the effect of home and maternal influence on the cognitive development of urban Negro preschool children. It was begun in response to the obvious problems of education of minority groups in urban areas and in response to a number of basic research and theoretical issues. The study was modified and revised in various ways in response to our own findings and to the research and writing of others in the field of compensatory education. A number of concepts central to the study were modified during stages of analysis; thus, they are occasionally presented in terms somewhat different from those used in earlier published papers describing the findings. This is one of two reports to come from this project; the second is a description of the academic performance and cognitive attainment of the children in this study when they reach school age. This follow-up report is now in the final stage of preparation.

The project described was in no way an intervention effort, but rather was intended to establish empirical base lines and to offer constructs and concepts which might be useful both to other researchers and to programs designed to change the educational opportunities and attainment of children from disadvantaged socioeconomic urban areas.

The research reported in this paper was supported by Research Grant #R34 from the Children's Bureau, Social Security Administration, Department of Health, Education, and Welfare; by the Ford Foundation Fund for the Advancement of Learning; by grants-in-aid from the Social Science Research Committee of the Division of Social Sciences, University of Chicago; by a grant from the Office of Economic Opportunity, Division of Research, Project Head Start; and by the Early Education Research Center at the University of Chicago, funded by the National Laboratory for Early Education, United States Office of Education.

Many people participated in various stages of the project, and we would like to acknowledge their essential roles in the study. Those who worked on field collection of data included Mrs. Dorothy Runner, who supervised the training and work of the home interviewers, acted as liason with public agencies, and had primary responsibility for obtaining the sample of subjects, Joan Massaquoi, Rachel Burch, Jennifer Legatt, Rhoda Stockwell, and Mary Tarrer. A number of persons were involved in testing the children and mothers: Marilyn Anderson, Kathryn Austin, Joan Blatt, Ella Mae Branstetter, Alice Dan, Gloria Davis, Rheta DeVries, Ethel Hull, Judy Jensen, Ruth Neisser Kaplan, Adina Kleiman, Nancy Kohn, Jane Lathrop, Phyllis Lett, Pamela Northcott, Margaret O'Neal, Shirley Smith, Phyllis Walesby, Lois Welch, and Linda Willson. Those who worked on the processing of the raw data included research associates Patti Gregory Kemper and Ellis Olim; research assistants Harriett Ainbinder, Vera Brodky, Aubrey Eaton, Dina Feitelson, Rogene Fox, Helen Hanesian, Boaz Kahana, Barbara Lee, Mildred Schaefer Levine, Mary Lou Lionells, and Susan Prescott; and coders Mia Beale, Jonathon Birnbaum, Arlene Brophy, Betty Chewning, Jane Crews, Gary Davis, Linda Erinoff, Mirriam Feiler, Alan Fiske, Stanley Greenberg, Rae Isenberg, Gregory Kavka, Mollie Lloyd, Lillian Lynk, Iona Marty, Dean Mitchell, Jerry Neugarten, Roberta Norin, Cathy

Sieving, Vicky Slavin, Judy Spivak, Nancy Vogeler, Carolyn Walsh, John Welwood, and Sandra Wilson. Computer programmers were Susan Beal, James Keene, and Eugene Lewis, Darrel Bock, J. David Jackson, and David Wiley served as statistical consultants. Secretarial duties were performed by Judy Anderson, Dorothy Andrews, Shirley Coleman, Kathy Eveland, Rose Glass, Anne Harker, Jane Heron, Nellie Hickman, Melissa Kern, Cynthia Kocher, Carol Lipsky, Helen Little, Sandra Pallett, Linda Pangburn, Louisa Powell, Roberta Reb, Linda Rothstein, Connie Roud, Carol Rubenstein, Arlene Rubin, Joyce Tetrev, and Helene Wijkman. Finally, several other persons assisted the staff in various ways not mentioned above: Donald Baer, Lance Dolphin, Linda Hartough, Russ McNeilly, Ella Pavlinek, and George Wise.

We would also like to thank the families who participated in this study and who gave us the information on which it is based.

The support of colleagues at the University of Chicago has been particularly important. Dean Francis Chase encouraged the study from its early stages and provided funds to supplement our initial grant; his successor, Dean Roald Campbell, gave us administrative support as well as financial assistance; both played more important roles in our project than they realized.

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CHAPTER I

THE BACKGROUND AND CONCEPTUAL CONTEXT OF THE RESEARCH

This is a report of a study designed to examine the processes through which social and economic disadvantage affect the early cognitive development and educability of urban preschool Negro children. It describes the first phase of a two-part study. This initial stage, begun in 1962, was intended to identify the specific elements of maternal behavior and home environments which are related to the cognitive performance of children. In a follow-up phase of the research program we studied the children again, during their early school years, in order to examine the effects of factors in the preschool environment upon later educational performance.

At the time this project was begun, concern over the educational problems of children in the slums and in lower-working-class sectors of the population was beginning to appear in publications of various kinds and in isolated research and demonstration projects in the United States; this concern had not yet reached the national proportions which later led to massive programs of compensatory education funded by federal legislation through the U.S. Office of Education and the Office of Economic Opportunity. At such a preliminary stage of knowledge and experience, it seemed essential to study systematically the early experience of children from urban working-class areas in order to understand the effects of social and economic experience upon the preschool child's cognitive and motivational capabilities. The rationale for this approach was that programs of intervention could be planned with more effectiveness and efficiency if they were based on knowledge of the abilities and disabilities that the child from a disadvantaged home brought to the nursery school, kindergarten, or first grade. The decision to work with preschool children was influenced by informal reports and observations indicating that in contrast to children from middle-class neighborhoods, many children from disadvantaged homes came to metropolitan school systems not prepared to undertake the typical curriculum of the first grade.

It was this discrepancy between the school readiness of working-class and middle-class children, together with the emerging interest in compensatory education, that led to the decision to study the preschool environments of children from different socioeconomic backgrounds. The purposes of the study could best be achieved by including in the project mothers and children from both middle- and working-class backgrounds, in order to examine variation in maternal behavior between and within social status groups.

This project was conceived not as an intervention effort but as an attempt to understand the processes which link social and cultural environments to the emerging capabilities of young children, with the expectation that an understanding of these processes would assist in planning effective intervention programs. In line with this objective, no attempts were made to interfere with the development of the children or with the behavior of the mothers studied. This project is unusual among studies of cultural disadvantage in that it sought to establish base lines of information about the characteristics of the early environment and the mechanisms which translate external social reality into patterns of behavior.

The decision to study the effects of disadvantaged social, cultural and economic environments upon preschool children carried with it the assumption that these effects are mediated in large part by the adults with whom the child most frequently interacts. For the young child, this typically is his mother. It was thus explicit in the initial proposal that the study would focus on the mothers' behavior, especially that involving their interaction with their preschool children. In a sense, the mothers were viewed as teachers and, to the extent that their behavior affected the cognitive development of their children and prepared them for school, their behavior and attitudes--expressing value patterns on which other behavior might be based--were regarded as maternal teaching styles.

This view of the child's early experience in his home as a socialization into cognitive modes was a departure from previous concepts of the socializing roles of parents, which have for the most part emphasized the effects of parental training in non-cognitive areas (Bronfenbrenner, 1958; Child, 1954; Sewell, 1961). The view of preschool maternal influence that characterized this study was broadened to include the concept of socialization of educability: readiness to use the teaching and learning resources of a formal school situation. This concept is examined in other sections of this volume and is discussed in detail in Chapter VIII.

These theoretical and empirical interests shaped the two major goals of the study which were:

1. To analyze social class differences in terms of specific elements of maternal behavior and environmental characteristics in order to examine the points of interaction between the environment and the child.
2. To identify and measure cognitive aspects of mother-child interaction and to identify maternal teaching styles and to study their effects upon the child's cognitive behavior.

In its broadest sense, this study was an inquiry into the relationship between social structure and individual behavior, with particular emphasis upon the functional connections linking social and cultural conditions at various socioeconomic levels to motivation and ability to learn in the classroom. The model of socialization upon which this study is based begins with the social, cultural and economic realities of the structure of society; the effects of these structural components are mediated through the behavior of adults and other socializing agents and are manifested in individual behavior. The second stage of the model is the adaptation of adults in the community to these critical features of the environment and the consequences of this adaptation for their own values, attitudes, and behavior. The patterns of child rearing that evolve thus reflect both the social structure and the adults' response to it. The children of the community confront social reality both through interaction with their parents and, especially in later years, directly through their own observations of the immediate environment and its resources in relation to other communities or families in the society. In summary, the connections between social structure may usefully be considered in terms of (a) the nature of the physical and social environment, (b) the effects of this environment upon the adults, (c) its effects upon the adults' consequent interaction with children, and (d) the behavioral outcomes that emerge in the children--e.g., cognitive skills, school achievement, patterns of interaction with the school, its rules and representatives. In line with the orientation of this study, the characteristics and effects of working-class environments are of special interest.

Some Relevant Features of the Environment of Urban Working-class Adults

In an investigation of the linkages between social structure and individual behavior, it is essential to identify aspects of a hierarchical social system--with its unequal distribution of rewards, opportunities, and resources--which are both salient and likely to be related to the socializing processes that ultimately shape the cognitive behavior and motivation of the young child. Although to designate certain factors as salient is an expression of one's point of view adopted to serve a line of argument, the features designated here as most significant are closely related to the dimensions of social stratification described by various social theorists (Kahl, 1957; Reissman, 1959; Warner, Meeker, & Eells, 1949). The attempt here is to identify those elements of the socioeconomic structure which are most powerful in the social and emotional world of the adults in the society, whether in the slums or in privileged affluent homes, and which will in turn affect the young child's view of the world and his modes of responding to it. These features are seen as operating at all levels of the structure, varying in amount and impact at different levels of the system, with different effects upon the socializing process.

Although these central (salient in our view) characteristics are conceptualized as general dimensions applying at all levels of social structure, in the interest of brevity the present discussion will focus primarily on their application to a particular subpart of society--the unskilled and semi-skilled working-class levels of Negro sectors of metropolitan communities. These characteristics have relevance not only for many of the families in our study but also for a much larger segment of society, especially those subparts which have been weakened and disadvantaged by discrimination.

Despite the pervasive effects of socioeconomic circumstances at various levels in the structure, there remains considerable variation among individuals within any given level. Variation in specific circumstances and in individual response patterns combine to produce both considerable overlap between social status levels and great individual differences among persons within a single level. An individual's behavior may often be partially determined by circumstances attributable to the operation of social structure or culture upon persons of his social status. However, his behavior may be an illustration of, an exception to, or an exaggeration of the modal pattern (exhibited by members of his social class, an ethnic group, or a socioeconomic segment). Each of the salient features to be discussed, then, should be regarded as applicable in varying degrees to all levels of society. However,

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the discussion will focus on one extreme but not unusual socioeconomic level--the urban poor.

Economic resources are not directly considered in this discussion because their role is assumed, rather than ignored. They are, obviously, central to a socioeconomic system and closely related to many aspects emphasized here. Indeed, the economic poverty of families in the slums is perhaps the most visible and pervasive fact of their lives. Without denying the importance of economic resources and their effect upon the physical and social surround at all socioeconomic status levels, the focus of this study was upon the social and psychological rather than the economic factors with which status in the socioeconomic hierarchy is associated.

One of the most significant dimensions of social structure in the United States is *the extent to which an individual has power* through status, prestige, or affiliation with an institution or organization, to control his own life and to deal with institutional authority. Lower-working-class adults have little influence, and powerlessness is one of their central problems. They are more likely to be arrested without justification and detained without adequate regard for civil rights. In mental health clinics, patients from working-class areas may be diagnosed as more maladjusted with poorer prognoses than are middle-class patients with similar records (Haase, 1956; Riessman, 1964). In emergency wards of hospitals, the poor get less adequate emergency treatment (Sudnow, 1967); and in many areas of their lives they have difficulty defending themselves against invasions of privacy, for example, by welfare agencies (Cloward & Piven, 1967).

Closely related to level of power is the degree to which one is *vulnerable to disaster*. Lower-working-class urban Negroes typically are without financial reserves of their own and are most likely to become unemployed with little advance notice or to be victimized by legislative and bureaucratic delay or interruption of welfare service. They possess little credit or borrowing power and are less likely to have friends with resources (Cloward & Elman, 1966). They live on the brink of incipient tragedy which they are powerless to avert, and in disaster situations they are less able to cope and recover (Koos, 1950).

The life circumstances of urban working-class Negores also *restrict the availability of alternatives for action*. Lack of economic resources, of power, of education, and of prestige set barriers to social and physical mobility and reduce opportunities for choosing among options concerning areas of residence, education, and employment. As a group they are subject to economic control by federal, state, and local public health and welfare agencies which furnish services and material supplies. The medical services at their disposal are severely limited, and they cannot afford to engage other services or facilities in the community. In general, there is a low level of literacy and education and a consequent lack of skill in obtaining information, making it difficult for them to use those alternatives technically or legally available to them.

A central dimension of social differentiation is the *disparity in prestige* enjoyed by members of different levels of the system. Urban working-class Negroes command relatively little prestige or esteem and are subjected to discrimination of various degrees, and their awareness of this position is a mediating screen through which perceptions and information are filtered. We assume that this awareness is acquired by children both through their own observations of the community in which they live and from parents who transmit to their children information and attitudes about their relative position in the community. The awareness of low-prestige status in the society and its effect on self-esteem comprise a significant part of the socialization process and may act more immediately upon performance in specific situations (Katz & Cohen, 1962; Katz, Goldston, & Benjamin, 1958).

A significant axis for differentiating occupational roles is that of authority: establishing policy vs. implementing others' decisions. The occupational experiences of working-class adults are different in essential ways from those of middle-class adults. The working-class adult, especially if he is in a semi-skilled or unskilled position, does not take part in the policy- or decision-making process, but carries out the decisions of others. His job depends upon his ability to follow the orders and instructions of others, with relatively little demand for initiative or reflection. He deals more typically with products than with ideas, and he is responsible primarily for his own compliance rather than the supervision of others. This feature of industrial society appears to express an inherent hierarchy within a complex industrialized occupational system and may be difficult, perhaps impossible, to modify (Kohn, 1963; Inkeles, 1960; Miller & Swanson, 1958).

Another feature of the life of a lower-class adult is the relatively *small overlap between his experiences and those of middle-class adults*. Lower-working-class adults have few experiences in common with middle-class adults, and in situations in which they are brought in contact, their roles are sufficiently different to cause the experience and the perception of the event to be dissimilar. Although there is sufficient information available about the middle-class, as for example through mass media, to make the lower working class aware of the values, resources, and way of life of the middle class, the range of experience covers much that is essentially dissimilar. The details of daily routine at home are vastly different; the conditions of work are discrepant even (or perhaps especially) when they work in the same factory, school building, or office. The life of a university, for example, must look quite different to the maintenance personnel than it does to the students and faculty. Occasional superficial or formal contact and exchange confirm the differences in prestige, status, and experience that underlie the basic dissimilarity in roles. Even so, the working-class individual is more often exposed to a middle-class way of life and thought by these contacts than is the middle-class individual to the way of life of the working class, especially the working-class urban Negro. Except through novels, occasional TV specials, and motion picture productions, few middle-class adults have had direct exposure to the homes, daily routine, and family life of the poor.

Some Psycho-social Consequences of Poverty

The relevance to this discussion of the circumstances of the external environment lies both in their direct effects upon children and in their transformation into socializing behavior of parents. For the most part, it is through the mediating behavior of older siblings and adults in his family that the young child learns to comprehend and to attach significance to the social and physical circumstances in which he lives. In considering the socialization of educability, the consequences of social class environments for adults is of particular significance: their adaptations to these external features shape patterns of behavior as well as motivation, aspirations, and expectations of rewards and success. Such adaptations occur at all levels of the society; affluence and poverty both elicit patterns of adaptive response. The concerns of this study, however, make the adaptive responses of the urban poor of special relevance. These adult orientations shape the child's world, eliciting, in turn, responses from him which may be functional in relating to the milieu of his family and community, but are much less useful in dealing with the public school as an institution and with the teaching and learning situations it presents.

There is, of course, great individual variation at all social class levels in the complex patterns of response that individuals acquire and express. These differences are as evident among the poor as among the wealthy; the stereotype of the welfare class common in mass media is itself an expression of the lack of information about the different ways in which individuals adapt to the circumstances of their daily lives. The degree of individual variation obtained on the measures in this study is presented in this volume. There is great variation among individuals at all socioeconomic status levels. It is significant, however, that the social system operates through legislation and communication based on stereotypes, imposing upon working-class urban families external conditions which offer relatively little variation in physical circumstances and life style, thus helping to fulfill the prophecy of stereotype and discrimination.

One consequence of poverty is that adults tend to perceive and structure relationships in terms of power. This orientation toward power and hierarchical structuring of relationships has been described in a number of studies. Maas (1953) observed it in the interaction among members of adolescent clubs with their club leaders; Christie and Jahoda (1954) observed it in the results of a number of studies and thought it to be a mark of authoritarian personality. Whyte (1955) observed the tendency to use power to structure social interaction in his work with "street corner society;" it may underlie the greater incidence of physical punishment as discipline in working-class families (Bronfenbrenner, 1958). An orientation to power would seem to follow from the lower-class person's position in the society. In jobs he is likely to hold, instructions are given as specific commands. He has little opportunity to help make decisions which determine the conditions of his work. In other situations that involve interaction with bureaucratic structures (welfare bureaus, police, hospitals, credit agencies), the low-status person has relatively little voice in the decisions which affect his daily life; his most characteristic and adaptive response is to comply and carry out instructions. Conversely, to have status and authority is to have power (Cohen & Hodges, 1963). In line with this orientation, the lower-class father tends to equate respect from children with their compliance and obedience to his wishes and commands (Cohen & Hodges, 1963; Kohn, 1959a, 1959b).

Another consequence of the circumstances of lower-class life is a cluster of attitudes that express low esteem, a sense of inefficiency, and passivity. These are regarded not so much as stable personality traits as they are adaptive responses to frustrations and unpredictability, to being acted upon, to being forced to wait for someone in authority to act. Contingencies linking action to outcome, as in the relation of middle-class behavior to community institutions, are frequently missing or intermittent in the ghetto. The relatively dependent position of the lower-working-class adult in the social structure is likely to induce magical thought and the tendency to look to super-human sources for support and assistance. The poor view the environment as unresponsive to individual effort (Hyman, 1953; Inkeles, 1960); and, perhaps consequently, the poor are more likely to accept events with resignation. One adaptation to this is to elect short term goals and to seek more immediately predictable gratification (Davis, 1948), or to resist and even, on occasion, to use illicit means (delinquent behavior) to achieve rewards not usually available (Cloward & Ohlin, 1960). As has been evident in recent events in this country, a frequent alternative to resignation is anger, protest, and violence. The extent and severity of racial conflict in this country is one expression of the power of the psychological response to social inequality in urban areas of the United States.

Another adaptive consequence of lower-class life is an unusual degree of *reliance upon non-work-related friendships and kinship contacts* for social support and resources. One expression of these social preferences is a lack of interaction with voluntary organizations and a consequent isolation from the institutions of the community (Wright & Hyman, 1958). Family life and social interaction outside the immediate family are composed primarily of a network of friends and kin to whom one can turn for assistance and support. Nonparticipation in organizations may follow from the inability of a lower-class adult to see the relationship between the events and needs of his own life and the goals of the organization (with the possible exception of the union). Skills called for (verbal facility, administrative skill, knowledge of procedures, ability to organize groups in pursuit of goals) are not likely to be developed. As there is little he can do to contribute and a limited perception of what the organization can do for him, there is little to be gained from membership (Cohen & Hodges, 1963). Institutions are not seen as sources of support, and the world of social contacts is divided into friends and strangers. From strangers he has no reason to expect fair or benign treatment; friendships are more salient.

Another consequence of lower-class life is the *restriction of language and linguistic modes of communication*. The interlacing of language and other forms of social behavior has been brilliantly stated by Bernstein (1961, 1964). Language serves behavior; to the extent that life among lower-working-class Negroes is restricted and lacks opportunities for selection among alternatives, their language has less need to be complex and differentiated. This does not imply that there is less communication in terms of frequency of speech or readiness to exchange messages, but that the patterning of speech differs in response to the nature of the interaction among participants (Schatzman & Strauss, 1955).

Viewed from one perspective, the life style of the urban poor seems to show a preference for the familiar and a simplification of the experiential world. In a study by Cohen and Hodges (1963) of workers from different socioeconomic status levels, lower-blue-collar workers were xx found more likely to agree with statements such as "I'm not the sort of person who enjoys starting a conversation with strangers on the bus or train," and "It is easier not to speak with strangers until they speak to you." To the open-ended question "What things bother you most in everyday life?" they were most likely to answer that things and people are unpredictable, and that they prefer familiar, routine events. This is not so much an expression of indifference to popularity as an indication of lack of confidence and fear of a social blunder (Cohen & Hodges, 1963). The lower-class adult apparently tends to level the contours of cognitive awareness and understanding and to interpret life in stereotypes, cliches, and familiar phrases (Bernstein, 1961).

Associated with this stance is a rejection of intellectuality (Cohen & Hodges, 1963), following in part from a mistrust of the unfamiliar--a sense of being unable to compete in modes of reasoning not familiar to them--and in part from a reluctance to accept standards of evaluation which would be to their disadvantage if applied to them. Also, the life circumstances of the poor orient them toward practical action. Their participation in work has not typically been one of policy-making; their experience has not been that of evaluating means and of developing ideas to guide action (Miller & Riessman, 1961).

The relative isolation of the lower-class person from the paths of experience of the dominant middle class is one antecedent of his relatively low level of skill and experience in obtaining and evaluating information about events and resources that affect or might affect his life. To put it more simply, he often doesn't know what to do and doesn't know how to find out. This ignorance makes him susceptible to exploitation by members of his community and by con men, unscrupulous repair men, loan agencies, and other individuals, agencies, and groups. It may be, as Cohen and Hodges (1963) argue, that this lack of information makes him more inclined to be credulous, especially of the printed word, and more likely to believe TV commercials: ". . . (the lower-blue-collar worker) has *few independent criteria for evaluating the content of the message, little awareness of specific alternatives, and little disposition to weigh evidence*" (Italics theirs). They comment that the field of his experience is unstructured, increasing suggestibility and gullibility as well as the possibility of eventual disappointment, frustration, and the feeling that life is unpredictable and that long-term probabilities of gratification are modest at best.

The Mediation of Social Reality Through Maternal Behavior

The point of view offered here is that the social and physical environments shape behavior and compel adaptations which are in turn transmitted to young children in interaction with adults, especially the mother. Later, the environment may increasingly exert direct influence upon the child, operating both through information from peers and through the child's own perceptions of the social and physical environment in which he lives, including his awareness of similarity or contrast with other children and other communities. In this study, however, the focus of research attention was upon the exchange between mother and child. This exchange seems to be linked to the contingencies of the environment which the mother herself experiences. Her behavior is, of course, a function of her own ability to deal with the problems of her environment; it is an expression of her own functioning intelligence. It is not possible to estimate what effect the mother's experience has had upon her own intellectual growth. It is somewhat more reasonable, perhaps, to regard her behavior as reflecting information-processing styles and strategies which combine her own native ability, the impact of her experience, and the circumstances in which she finds herself. The relative contribution of these sources of influence is, of course, unknown. The objective of this project was to understand how environmental variables are mediated through her behavior in more specific ways than are suggested by IQ score or social class membership.

A prominent concept in planning the study and in the analysis of data was the concept of educability. Intended to be heuristic and to represent an orientation and point of view that would help organize the data and their interpretation, educability is seen as an intersect of three general orders of characteristics: a cluster of specifically cognitive skills, such as discrimination, concept formation, language facility, numerical and spatial abilities; a motivation to achieve in a formal classroom situation, to accept the goals of the schools as valued objectives deserving commitment of time and energy; and the acquisition of the role of pupil, a configuration of behaviors and attitudes relating the child to the school as an institution and to the procedures, norms, and regulations which are a part of the operation of the school. The first of these (cognitive activities) and the third (role of pupil) are discussed later in this volume; unfortunately, the problem of motivation is not considered in a formal or systematic way. In part, this is because the children of the study were only four when the data were collected and there was limited opportunity to examine this type of behavior. However, for a number of practical and methodological reasons, we allocated less attention to this type of behavior in both the first phase of the study and the follow-up project.

Within this broad conceptual framework, the project was designed to identify specific maternal behaviors which mediate between the environment and the development of cognitive ability and educability in preschool children. From this viewpoint, the study concentrates on input features of the socializing process--it attempts to describe how the child becomes aware of the external world, the bases on which he selects and processes information that comes to him from both external and internal sources. As such, it is possible to regard the mother as a teacher, and to examine her role in making the child aware of the pattern and profile of stimuli that reach him. In this way she controls the evaluation and interpretation of input, and by selecting, emphasizing, reinforcing, and screening information, she establishes contingencies which help shape the child's strategies and capabilities for processing information.

This study dealt with social class differences in order to show the contrast among groups within an urban population and to assure that a wide range of maternal and child behavior would be included. It was not intended to demonstrate or examine social class differences as such. Rather, social status divergencies represent a point from which to initiate an analysis of the specific elements of maternal behavior which have cognitive consequences for the child's development. This is not a denial of the importance of social class or of its usefulness as a concept in predicting behavior, but an attempt to understand what social class is if it is viewed through a microscope which reveals the contingencies of interaction between mother and child. The concept of disadvantage begins with the interaction between the social and physical environment and the adult; the study of social class effects upon behavior extends the analysis of environmental transactions to the exchange between mother and child. Neither social class nor maternal care operates in magical fashion; there are points of interaction and exchange between individual and environment and these points of contact can be studied more effectively by close examination of behavior that is concealed by such concepts as social class, maternal warmth, discipline, permissiveness, etc. We see the exchange as an array of behavioral contingencies that link the social structure to the developing behavior of the young child.

The subsequent chapters of this volume deal with the major dimensions of the study and the results of our investigation. The intent of the analysis and of the interpretations is to offer data and a point of view that will lead to new research endeavors with more precise empirical methods and more illuminating theoretical formulations.

CHAPTER II

RESEARCH PROCEDURES

In examining the impact of the family and home environment on the preschool child's cognitive development and educability, the project staff has attempted to delineate those processes by which a mother prepares or does not prepare her child to successfully achieve in the school situation. The gross behavioral differences between middle- and working-class children during the first years of school are evidence that more school-relevant learning takes place in the middle-class home than in the working-class home. This consideration plus the serious problem of under-education of large sectors of the Negro population led us to focus on the socialization of cognitive behavior in preschool Negro children from both middle-class and disadvantaged urban backgrounds. The reported matriarchal structure of the Negro family and the greater amount of time that the preschool child generally spends with his mother led us to concentrate on the mother-child interaction, viewing the mother as the primary socializing agent at this time. Since many of these children grow up in fatherless homes (Bloom, Whiteman, and Deutsch, 1965; Deutsch and Brown, 1964) and many of these families in urban areas are concentrated in public housing projects--factors whose effects, though increasing, are little known--it seemed necessary to control for these variables in recruiting our research group.

The population to be studied was then selected according to criteria based on the above considerations.

Research Groups

Definition of Groups

A research group of 163 mothers and their four-year-old children was selected to provide variation along four dimensions: socioeconomic background, type of housing, economic dependency status, and intactness of family. All subjects were Negroes, non-working mothers, free from any obvious mental or physical disabilities. The criteria for selection of sub-groups and the composition of each group were:

Group A (N=40)

occupational level:[1] professional, executive, managerial;
education:[2] college attendance but not necessarily college degree;
housing: private;
economic status: no dependency;
family structure: intact.

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[1] Occupation of husband except in Group D.

[2] Minimum educational level attained by both parents except in Group D.

Group B (N=42)

occupational level: skilled blue collar;
education: some high school but not exceeding grade 12;
housing: one-half public housing, one-half private housing;
economic status: no dependency;
family structure: intact.

Group C (N=40)

occupational level: unskilled or semiskilled;
education: not beyond 10th grade;
housing: one-half public housing, one-half private housing;
economic status: no dependency;
family structure: intact.

Group D (N=41)

occupational level: unskilled or semiskilled (last employment);
education: not exceeding 10th grade;
housing: one-half public housing, one-half private housing;
economic status: dependent on public assistance (ADC);
family structure: father absent.

In each group mother-child pairs were selected to give equal sex distribution of children; age of children when first tested ranged from 3 years 9 months to 4 years 4 months. The composition of the total group is summarized as follows:

Occupational level	
Professional	40
Skilled	42
Unskilled	81
Housing	
Private	101
Public	62
Economic status	
Independent	122
Dependent on Public Assistance	41
Family composition	
Intact	122
Father absent	41

Total 163

TABLE II-1

Comparison by Social Status of Mothers' Mean Age and Number of Years of Academic Schooling

Social Status	Age	(s.d.)	Years of Schooling	(s.d.)
Middle Class	32.0	(3.92)	15.3	(1.62)
Working Class:				
Skilled	29.4	(5.96)	11.4	(1.08)
Unskilled:				
Father Present	30.4	(6.70)	9.0	(1.85)
Father Absent	30.2	(7.28)	8.6	(1.61)

TABLE II-2

Mother's Birthplace, Percentage Distribution by Social Status

Region	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Chicago	42.5	16.7	27.5	29.3
Midwest	17.5	9.5	5.0	7.3
North East	2.5	0.0	0.0	0.0
South East	20.0	2.4	5.0	2.4
South West	2.5	2.4	0.0	0.0
South Central	15.0	69.0	62.5	61.0

TABLE II-3

Mother's Length of Residence in Chicago,
Percentage Distribution by Social Status

Number of Years	Social Status			
		Working Class		
	Middle Class	Skilled	Unskilled	
			Father Present	Father Absent
less than one	0.0	0.0	0.0	0.0
one to two	0.0	0.0	5.1	2.4
three to six	15.0	11.9	12.8	12.2
seven to eleven	22.5	23.8	15.4	9.8
twelve to seventeen	12.5	26.2	12.8	19.5
more than seventeen	50.0	38.1	53.8	56.1

TABLE II-4

Social Status Differences in Mean IQs
of Mothers and Children

	Social Status			
		Working Class		
	Middle Class	Skilled	Unskilled	
			Father Present	Father Absent
WAIS Verbal IQ	109.4	91.8	82.5	82.4
(standard deviation)	(11.29)	(13.85)	(13.58)	(13.60)
Stanford-Binet IQ (Form LM)	109.4	98.6	96.3	94.5
(standard deviation)	(14.98)	(14.52)	(10.42)	(9.72)
Difference	0.0	6.8	13.8	12.1

TABLE II-5

Annual Family Income, Percentage Distribution by Social Status

Income	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
No information	0.0	0.0	2.5	0.0
Over $20,000	12.5	0.0	0.0	0.0
$15,000 - 19,999	25.0	0.0	0.0	0.0
$10,000 - 14,999	27.5	4.8	0.0	0.0
$ 7,000 - 9,999	22.5	16.7	5.0	0.0
$ 5,000 - 6,999	10.0	26.2	20.0	0.0
$ 3,000 - 4,999	2.5	42.9	55.0	17.1
$ 2,000 - 2,999	0.0	9.5	17.5	43.9
$ 1,000 - 1,999	0.0	0.0	0.0	39.0

TABLE II-6

Social Status Differences in Mother's Religious Preference, Percentage Distribution by Social Status

Religion	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Protestant	55.0	71.4	85.0	82.9
Roman Catholic	35.0	19.0	5.0	17.1
Other	10.0	7.1	7.5	0.0
None	0.0	2.4	2.5	0.0

TABLE II-7

Social Status Differences in Size of Family and Home

	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Mean Number of People in the Home	5.3	6.1	6.1	5.9
(standard deviation)	(1.68)	(2.20)	(1.73)	(2.33)
Mean Number of Rooms per Person	1.43	0.94	0.81	0.90
(standard deviation)	(0.46)	(0.29)	(0.29)	(0.26)
Mean Number of Children in the Home	3.1	4.0	4.1	4.4
(standard deviation)	(1.46)	(2.11)	(1.79)	(1.98)
Mean Number of Children per Adult	1.50	1.90	2.02	4.00
(standard deviation)	(0.73)	(1.05)	(0.91)	(2.01)

Sources

The subjects for this study came from a variety of neighborhoods in south side Chicago They were recruited from several sources, including public housing projects, settlement houses, churches, the Department of Public Welfare, key people in the community, and private recruitment efforts of interviewers.

Refusals

Most persons who were contacted cooperated eagerly. The best response came from skilled working- and middle-class groups (5 refusals from a total of 86 women contacted).

For a variety of reasons, there were more refusals among the unskilled working-class groups, especially among ADC mothers. A major reason for this follows from the problems inherent in their status in the community. The ADC mother and other disadvantaged persons have been the brunt of so much investigation and adverse publicity that they tend to respond fearfully and negatively to any experience which they think might jeopardize their employment, their housing, or their status with the public assistance program. Some of the refusals expressed distrust of the interviewer; other women could not be found after agreeing to participate. Typical of the above reaction is the case of Mrs. B.:

> Mrs. B. accepted an appointment with the interviewer, but when the interviewer arrived Mrs. B. was actively engaged in housework

> and suggested that another appointment be arranged. When the interviewer appeared for the second appointment, Mrs. B. met her at the door, refused to admit her, and accused her of being a spy for the relief."

The peak period of refusals came during a bitter public controversy over the merits of the ADC program. The rate of refusals declined sharply thereafter.

Refusal to be interviewed, however, was not the only major problem in obtaining data. It was sometimes difficult to maintain the interest of the interviewees throughout the study procedure. This also was primarily a problem with the women from unskilled and lower educational backgrounds. In these groups, the initial interview in the home usually presented no problem, but the request to come to the University for two sessions sometimes aroused apprehension and caused delay. Some women felt uncomfortable about leaving home to come to an unknown setting; for others, family responsibilities and the lack of baby sitters conflicted with the testing schedule. Staff members made additional home visits, called neighbors and relevant agencies, and arranged for baby sitters when the mother had several other small children. On occasion the interviewer had to accompany the mother on her visit to the University. For a few of these cases, the efforts described above were repeated many times before the mother finished the study porcess. For example:

> Mrs. I., a woman in her early forties, the mother of ten children, agreed to participate in the study and went through the first interview readily once she understood it. She said that she had lived in poor circumstances all of her life and did not have much education but was interested in her children and wanted them to have things better.
>
> She missed several appointments for her first scheduled visit to the University. Home visits were made several times in an attempt to encourage her to follow through. She would promise, but she would not come. One day, unannounced, she arrived at the testing center and said that she was ready to finish her part in the study. It was learned later that Mrs. I's high school daughter was largely responsible for her mother's appearance. Mrs. I. missed her appointments for final testing several times in a row as she had for the first session. The testing staff then went to her home and completed the tests. She was cordial and cooperative at this time and subsequently urged a relative to be part of the study.

Data-gathering Procedures

The following procedures reflect the staff's intent to investigate the cognitive environments of preschool children with special emphasis on the linguistic environment within which the child develops:

Interviewing

The mothers were visited twice in the home for approximately $1\frac{1}{2}$ hours per visit by trained Negro social workers. In these interviews information was obtained, by both structured and unstructured techniques, concerning the mother's educational background and aspirations for herself and child, her attitudes toward school and education, and the availability and use of physical resources in the home and community.

Several open-ended questions (tape recorded) presenting hypothetical situations involving school provided data on the mother's a) attitudes about education, b) expectations about her child's performance in school, and c) use of language to convey and expand ideas. In addition, the interviewer summarized the circumstances of the interview and her impressions of the mother (family interaction, life style, etc.) and rated the interviewee's rapport (degree of cooperation and openness shown). She also rated the mother-child interaction in terms of a) amount of support, b) affection, and c) pressure for obedience and achievement.

Testing

To provide a controlled situation for testing, the mother and child were brought to the University Nursery School. Requests that the mother and child participate in the testing program were made after the interview data were obtained. To facilitate cooperation, baby sitters were supplied when necessary and a livery service was engaged to provide transportation.

During the first testing session, the mother and her child were administered individual tests of intellectual performance. As soon as possible (usually two weeks later), they were seen for individually administered tests tapping factors, such as curiosity and impulsivity, which are related to cognitive and academic performance.

Observing and Recording Mother-Child Interaction

The last phase of the testing was designed to provide data on maternal teaching styles. These sessions dealt specifically with nonintellective factors, such as support and pressure, as well as with cognitive aspects of mother-child interaction.

In these interactive situations the mother was taught three simple tasks (sorting toys, sorting blocks, and making designs with an Etch-a-Sketch toy) and then was asked to teach these tasks to her child. The mother and child were left alone; their verbal interaction was recorded on tape. In addition, the on-going behaviors of the mother and child were described and recorded by observers behind a one-way window. The purpose of recording descriptions of the actions of the mother and the child and the interaction between them was to provide a context for making ratings at a later date. Two observers simultaneously recording onto different tapes were used to establish inter-observer agreement; these trained observers were then used throughout the study.

Instruments

Pilot testing was conducted with each task to explore its use with women and children from a variety of socioeconomic backgrounds. In some cases this led to revisions in format or administration. For example, since many of the working-class mothers read with difficulty, examiners read the Thurstone and Plutchik items to all the mothers; on the Thurstone, simpler language was substituted so that the meaning of each item was clear. The instruments employed were:

For the mother

1. Interview
2. Educational Attitude Survey
3. Hypothetical situations to which the mother must respond with her probable action about:
   a. Teacher-child and child-peer problems arising in the school situation
   b. Offenses and failures occurring while the child is trying to master a skill
4. Thematic materials
   a. Mother-teacher card
   b. Child's Apperception Test (CAT) card #3 (lion-mouse)
5. Wechsler Adult Intelligence Scale (WAIS)
6. Sigel Sorting Task
7. Wechsler Intelligence Scale for Children (WISC) Mazes
8. Twenty Questions Task
9. Thurstone Personal Preference Record
10. Plutchik Exploratory-Interest Questionnaire

For the child

1. Stanford-Binet, Form LM
2. Columbia Mental Maturity Scale
3. Sigel Sorting Task
4. Curiosity Task (experimental measure of preference for stimulus complexity)

For both mother and child

1. Toys Sorting Task
2. Block Sorting Task
3. Replication of designs with an Etch-a-Sketch

Data Analysis

When scoring procedures were not already available, as was the case with the open-ended interview questions and interaction protocols, coding schemata were devised, tested on non-sample data, and used only when both the scale and the coder had obtained reliabilities above .85. In most cases intra- and inter-rater reliability was above .90. All differences in coding were resolved by discussion between raters and a third supervisory staff member before being recorded as final scores. Specific coding categories will be discussed when appropriate to a particular chapter. The actual rating scales and coding schemata used may be found in the Appendices.

The data from the various instruments were first analyzed according to the major independent variables--socioeconomic status, sex of child, and housing--since the availability of such descriptive data at the present time is meager. Various correlation techniques then allowed us to assess the relationship between certain mother-child variables, focusing on behaviors that cut across these major groupings. Regression analyses have been utilized in studying the power of certain maternal behaviors to predict the child's cognitive behavior. These statistical tools have emphasized the "umbrella" nature of such terms as social class, for they allow us to determine the specific behaviors that are likely to accompany such classification and account for the descriptive differences observed.

CHAPTER III

THE RELATION OF FAMILY RESOURCES AND MATERNAL LIFE STYLES TO MATERNAL COGNITIVE ENVIRONMENT AND COGNITIVE PERFORMANCE OF CHILDREN

The ultimate concern of this study was to understand the effects of maternal behavior within the family environment upon the educability of children. Thus in our laboratory studies and quasi-experimental work we sampled the maternal environment using mother-child interactions in instructional situations. These situations presumably offered examples--albeit modified--of experiences encountered by the child at home. We recognize also that contact between child and culture occurs in numerous interactions: adults may define and structure the child's experiential world through direct interpersonal contacts, or they may exert an indirect influence, neither purposeful nor explicit, through cues, patterns, models, ideas, and values. Our sampling of the maternal environment in laboratory situations must therefore be supplemented with other data representing the family's history, its way of life, and the patterns of interaction it now maintains with the community.

In this chapter we will examine supplemental data from the child's environment, attempting to assess its role in shaping his cognitive performance. Most of this supplemental data was gathered by trained social workers who visited the home twice for interviews (details of administering and scoring the home interviews are given in Appendix A). The variables of family environment are divided for purposes of analysis into four groupings: structural-social: historical elements, family structure, and other features of the environment which, because of a structural condition or past events, become a part of the family's life; home resources: the mother's provision and use of domestic resources in service of the child's development; orientation to the community: the style and extent of the family's interaction with the community and the mother's attitude toward the external (non-family) world; and maternal personality: selected measures, e.g., affect or dominance, from standard and experimental instruments of personality assessment. These groups of variables are considered in relation to each other, to maternal teaching styles (defined in detail in Chapters IV and V), and to the child's cognitive performance.

The Relationship of Family Structure and Circumstances to Maternal Behavior and Child Performance

The family's structure and the child's position within it exercise constraints, shape interactions among family members, and determine to a degree the interaction between the family and the community's institutions. In addition, our data on family structure and resources as they vary with social status are of considerable interest.

For this discussion, the relevant variables are clustered into 1) family structure: intactness, mother's age, and birth order and sex of the child in the research sample; and 2) family circumstances: measures of crowding--the ratio of housing space to family size--and type of housing.

Two of the variables, father-absence and public vs. private housing, were used as criteria in the initial selection of families for the project and thus are of particular importance in view of their presumed relationship to maternal and child measures.

Family Structure

Impact of father's presence or absence. Two groups of mother-child pairs were selected from families of comparable schooling and occupation (unskilled or semiskilled). The families in one group were intact; the father was absent from families in the other group. In addition, the father-absent families were dependent on state aid through the Aid to Dependent Children program. This twofold difference between the two groups confounds the analysis, of course, but since these two variables originated in the policy of the welfare agencies, they could not be disengaged.

Nonetheless, it is of interest to examine the relative performance of both children and mothers from these two groups. It had been hypothesized in an early paper (Hess, 1964) that the impact of welfare programs on the morale and activity of a family would be to depress verbal communication and other types of cognitive exchange. A number of studies have shown the effects of father absence to be deleterious, especially in the areas of sex-role identification but also on more academically relevant test achievements (Lynn & Sawrey, 1959; Deutsch & Brown, 1964). Other data show less difference in academic performance of Negro children in the public schools (Coleman, 1966). We wanted, then, to see whether economic self-sufficiency and intact families would accentuate each other, producing a greater distinction in favor of the non-welfare, father-present group than would either variable in isolation.

We found, however, that there was relatively little difference in the performance of mothers of the two working-class (unskilled) groups. Table III-1 presents the major variables (including demographic items) on which significant differences appeared.

It is possible, even though the measures of maternal behavior show little difference between the two groups, that an incomplete nuclear family may nevertheless affect the child's behavior. The impact of father-absence may come from the lack of a male parent, or it may be indirectly mediated through the changes caused in a mother living without a mate or managing alone. It is in the behavior of the children of the two groups, therefore, that a more significant comparison is to be made. As Table III-2 shows, however, mean performance of the two groups of children differs significantly for only a few variables.

That there are relatively few differences between the two groups at this preschool level does not rule out the possibility of cumulative effects of father-absence appearing in clearer form in the follow-up results.

TABLE III-1

Comparison of Demographic and Maternal Data for Father-Present (Intact) and Father-Absent Families from Similar Occupational Levels

Variable	Means		Level of Significance*
	Father Present	Father Absent	
Availability and Use of Home Resources	1.99	3.04	.078
Mother's Out-of-Home Activities	1.2	0.5	.004
School-Peer: % Personal-subjective	26.4	21.9	.060
School-Peer: % Status-normative	41.7	50.7	.006
School-Peer: % Irrelevant	7.4	3.4	.026*
Mastery: % Cognitive-rational	1.7	0.6	.064
Specificity Index (Block Sorting Task)	44.72	39.17	.043
Praise and Engagement in Interaction (low score = high use)	20.21	20.63	.107
Mother's General Verbal Specificity in Block Sorting Task (low score = high specificity)	19.90	20.24	.070
Difference Between Mother's Aspiration and Expectation for Child's Educational Achievement	1.8	1.0	.016*
"More Traditional Education" (low score = agree)	18.0	16.7	.066
Thurstone Personal Preference Record: Vigorous	7.9	9.3	.075*
Mother's Sigel: Average Reaction Time per Sort	33.6	26.8	.078
Plutchik (E-I): Total Exploratory Items Liked	19.4	21.2	.066*

*Starred items indicate that the two-tailed test was used, since the difference was not in the expected direction; unstarred significance levels are for one-tailed tests.

TABLE III-2

Comparison of Performance of Children from Father-Present (Intact) and Father-Absent Families from Similar Occupational Levels

Variable	Means		Level of Significance (one-tailed test)
	Father Present	Father Absent	
Interruptive Distraction (Block Sorting Task)	.42	.67	.030
Errors (Block Sorting) (low score = high error rate)	20.08	19.49	.078
Confidence Factor (Binet)	20.06	19.69	.035

Mother's age. The age of the mother at the time of testing (WAIS administration) shows only a slight association with other measures. The data are shown in Table III-3. The coefficients in this table indicate that the age of the mother has some relationship to her behavior, but the pattern is not consistent. The mother who is older has been in Chicago longer and tends to have a larger family. She is likely to be more involved in out-of-home activities, but to engage in fewer hours of visiting in the home. She was rated as having and using richer resources about the home than younger mothers, to use a less person-oriented control strategy, and to be less impulsive and more stable, as indicated by the Thurstone personality instrument. In teaching situations she used the model more, tended to use praise and engaging as a technique more, but to use fewer specific messages than did younger women.

This pattern of correlations is quite similar for both the total group and the working-class groups (total group minus the middle-class women). The slightly inverse relationship in these data suggests that women may not acquire more effective techniques with age. Maternal age is not related to social class level in the total group and thus is not confounded with other class-related variables.

Birth order. In preliminary analyses of data, birth order was included in the correlational matrix. It was not significantly related to other variables and was dropped from further analysis. This lack of association, however, may follow from the complexity of the interaction between sex, birth order, and number of children in the family. It does not necessarily support an interpretation that patterns of birth order and related variables have no relationship to maternal behavior or child performance.

Sex of subject. It seemed likely that mothers would interact in different ways with girls than with boys, particularly in view of the research literature showing that sex differences appear at an early age and that girls tend to be more compliant and cooperative than boys (Maccoby, 1966). Particularly intriguing was the possibility that maternal behavior at the preschool level would be associated with differences in performance of males and females during the early school

TABLE III-3

Correlations between Mother's Age and Other Demographic and Maternal Measures*

Variable	Total Sample	Three Working-Class Groups
Mother's Length of Residence in Chicago	.24	.28
Number of People in the Home	.14	.19
Rooms per Person	.19	.13
Availability and Use of Home Resources (low score = rich)	-.21	-.16
Mother's Out-of-Home Activities	.20	.18
Amount of Visiting per Week (low score = many hours)	.19	.22
School-Peer: % Personal-subjective	-.16	-.24
Mastery: % Personal-subjective	-.08	-.17
Number of Models Mother Shows Child (Etch-a-Sketch)	.24	.23
Mother's Tendency to Praise Child (Block Sorting Task) (low score = high tendency)	-.11	-.17
Specificity Index (Block Sorting Task)	-.13	-.20
Praise and Engagement in Interaction (low score = high use)	-.16	-.15
Thurstone Personal Preference Record: Impulsive	-.19	-.22
Thurstone Personal Preference Record: Stable	.16	.14

*For the total sample, $p=.05$ when $r \geq \pm .16$; $p=.01$ when $r \geq \pm .21$. For the three working-class groups, $p=.05$ when $r \geq \pm .18$; $p=.01$ when $r \geq \pm .25$.

years. We therefore selected as subjects an equal number of boys and girls, both to neutralize possible effects of sex on group means and to permit comparisons of males with females.

In our data, however, there is little evidence that maternal behavior is related to the sex of the child. There are differences in performance between males and females in the study, however, and these are described in the follow-up report.

Family Circumstances

The effects of crowding. Three measures of family size and crowding were analyzed: total number of people (children and adults) in the home; the ratio of rooms to people; and the total number of children in the family. Means for these variables are shown in Table II-7 (Chapter II). Results for the third measure are not reported because of the similarity to other measures and because number of children seemed to have less meaning, in terms of the effect on maternal behavior, than did the measure of total number of people in the home. Only two measures--total number of people and rooms per person--will be discussed here.

Both of these variables are related to several other measures of family structure and to the behavior of the mother. The ratio of rooms to people is highly related to social status level; correlations are reported here for the three working-class groups, middle class excluded. Table III-4 shows significant correlations between these two variables and a number of other demographic, maternal, and child measures.

TABLE III-4

Correlation of "Crowding" Measures with Other Demographic, Mother, and Child Variables*
(Three Working-Class Groups Only)

Variable	Total Number of Persons in the Home	Rooms per Person
Availability and Use of Home Resources (low score = rich)	.14	-.35
Use of Reading Material by Child with Adult (low score = frequent use)	.26	-.21
Maternal Support toward Child (low score = high support)	.23	-.26
Global Achievement Pressure (low score = high pressure)	.25	-.18
First Day: % Imperative	.28	-.11
First Day: % Status-normative	.26	-.09
School-Peer: % Personal-subjective	-.26	.26
Verbal Task Interaction	-.20	.13
Mother's Tendency to Praise Child (Etch-a-Sketch) (low score = high tendency)	.15	-.09
Maternal Affectionateness during Interaction	.16	-.04
Coercive Control during Interaction (low score = high use)	.24	-.10
Difference between Mother's Aspiration and Expectation for Child's Educational Achievement	.20	-.20

TABLE III-4 - continued

Variable	Total Number of Persons in the Home	Rooms per Person
Personal Optimism (low score = high optimism)	.18	-.16
"Powerlessness" (low score = agree)	-.27	.17
Mother's Sigel: Descriptive-global	-.16	.12
Thurstone Personal Preference Record: Impulsive	-.27	.06
Mother's Sigel: Average Number of Figures per Sort	-.15	.09
Successive Scanning ("Twenty Questions")	-.21	.19
Constraining ("Twenty Questions")	-.15	.16
Spuriously Successful Block Placement	.18	-.08
Teaching Period Resistance	-.19	-.02
Test Period Inhibition	.26	-.10
Child's Resistance during Interaction (low score = high resistance)	.18	-.13
Child's Verbal Participation in Interaction (low score = high participation)	.16	-.09
Confidence Factor (Binet)	.10	-.20
Activity Factor (Binet) (low score = optimal behavior)	.17	-.11

* p=.05 when $\underline{r} \geq \pm.18$; p=.01 when $\underline{r} \geq \pm.25$.

The degree of crowding in the home is apparently related to a number of maternal characteristics and abilities, including several that are, in turn, associated with the children's performance: the tendency to make imperative statements, feelings of powerlessness in relation to the school, low personal-subjective orientation, and infrequent use of reading material with the child. For the three working-class groups, however, these measures are not related to the mother's intelligence test scores.

The mother who has a relatively large number of persons in the home tends to show maternal behaviors which, this study suggests, do not enhance the development of the child's cognitive ability: for example, she is likely to be more status-oriented in her control strategies, to spend less time reading to her children, to show less warmth and support (as seen by the interviewer), to feel relatively powerless in dealing with the school, to express greater difference between her aspirations for her child and what she expects he will accomplish, and to exert less pressure for achievement on her child.

Children from more crowded homes tend to show greater inhibition, less active resistance, and less involvement in the interaction situation.

Public vs. private housing. Housing and home conditions have been of great concern to observers in poor urban communities, and there have been some efforts by both governmental and private agencies to provide suitable low-cost housing for urban working-class families. The underlying consideration involved in these programs has been that better living conditions would make possible more adequate family interaction, a more favorable environment for the children during their developing years, and a safer, more secure home for the family. These improved conditions would be expected to affect a wide range of behavioral indices; thus as a precaution against possible bias in the results of the study, equal numbers of the research groups from working-class occupational levels were drawn from private housing and public housing. The results of comparing the two groups are shown in Table III-5. The trends in this table are not striking and not always consistent. On the basis of the experience of our research staff in these homes, however, it is doubtful that this comparison is an adequate test of the hypothesis that public housing has a positive effect on maternal and child behavior. In the first place, the public housing units were in some instances high-rise apartments with their own peculiar dangers and disadvantages: elevators and corridors are not secure; children are not safe from attack or threat of attack; playgrounds are distant and not easily monitored by mothers. Second, there was considerable variation from one home to another, within public and private housing, making it incautious to regard them as two clearly separate types of homes. In a more adequate examination of the effects of housing type, it might also be necessary to take into account the length of time the family had been living in the building.

The Relationship of Home Resources to Maternal Behavior and Child Performance

The child's educability, or readiness for school, depends not only on the existence of skills required for entrance into school but also on certain attitudes allowing ease of adjustment to the role of pupil. Both these skills and these attitudes can be influenced by the home's resources. These resources may be objects, events, or persons in the home environment which function to provide experience and information and to stimulate the child's development. The data on home resources used in this study are taken primarily from mothers' responses during, and interviewers' comments on, the home interview sessions. Nine categories or patterns of home resources were used: physical space, physical movement, physical appearance and care, play, work-orientation, direct learning, indirect learning, direct social contacts, and indirect social contacts. Scores for all families on each of the nine Home Resources Patterns scales were subjected to a principal component factor analysis; the general score thus obtained was used as the basic home resources measure. This measure takes into account the availability of resources but is an even better indicator of utilization of resources. (Appendix B, Home Resources Patterns, gives detailed information on the assessment of home resources.)

The relationship of the utilization of home resources to the mother's attitudes and the child's behavior is suggested in Table III-6. As before, correlations are presented for the three working-class groups with the middle class excluded. Correlations are also reported

TABLE III-5

Comparison of Performance of Mothers and Children in Private Housing and Public Housing (Three Working-Class Groups Only)

Variable	Means		Level of Significance (two-tailed test)
	Private Housing	Public Housing	
Number of People in the Home	5.4	6.7	.001
Interviewer's Rating of Mother's Cooperativeness (low score = very cooperative)	1.8	2.1	.047
Mother's Tendency to Praise Child (Block Sorting Task) (low score = high tendency)	8.0	7.4	.073
Maternal Affectionateness in Interaction (low score = high use)	18.8	20.0	.083
Praise and Engagement in Interaction (low score = high use)	20.67	20.20	.068
Personal Optimism (low score = high optimism)	2.0	2.2	.099
Mother's Sigel: Descriptive-global	1.6	2.2	.032
Thurstone Personal Preference Record: Vigorous	9.2	7.8	.019
Thurstone Personal Preference Record: Impulsive	11.7	10.1	.013
Thurstone Personal Preference Record: Dominant	10.85	9.64	.111
Plutchik (E-I): Total Exploratory Items Liked	21.4	19.3	.016
Binet IQ	98.8	94.0	.023
Block Sorting Task Score	2.0	1.5	.112
Child's Sigel: Nonverbal	6.2	8.6	.058
Child's Sigel: Scorable	5.5	3.6	.036
Activity Factor (Binet) (low score = optimal behavior)	19.95	20.26	.085
Optimal Behavior during Testing (Binet General Factor)	20.47	18.37	.029
Curiosity Total Time Score	146.75	101.73	.068
Curiosity Ratio Score	.509	.533	.097

TABLE III-6

Correlation of Home Resources Factor*
with Other Demographic, Maternal,
and Child Variables**

	Working-Class Groups Total	Boys: Working-Class Groups	Girls: Working-Class Groups
Rooms per Person	-.35	-.30	-.40
Mother's Out-of-Home Activities	-.39	-.33	-.43
Personal Optimism (low score = high optimism)	.33	.10	.54
"Powerlessness" (low score = agree)	-.39	-.27	-.51
Global Achievement Pressure (low score = high pressure)	.38	.23	.52
First Day: % Imperative	.23	.13	.34
School-Peer: Personal-subjective	-.27	-.23	-.34
Child's Block Sorting Score	-.23	-.14	-.30
Child's Behavior Problems during Teaching Period (Block Sorting Task)	.18	.02	.32
Child's Sigel: Nonverbal Responses	.29	.31	.26
Child's Sigel: Scorable Responses	-.25	-.38	-.14
Binet IQ	-.31	-.06	-.53

* low score = rich utilization

** For working-class groups, p=.05 when $\underline{r} \geq \pm.19$,
p=.01 when $\underline{r} \geq \pm.24$.

For boys, p=.05 when $\underline{r} \geq \pm.27$;
p=.01 when $\underline{r} \geq \pm.32$.

For girls, p=.05 when $\underline{r} \geq \pm.26$
p=.01 when $\underline{r} \geq \pm.34$

separately for boys and girls in the working-class groups; although most discussion of sex differences appears in the follow-up study, the differences between boys and girls were in this case striking enough to be reported here.

Mothers who made rich use of home resources tended to have fairly high personal optimism, to use personal-subjective control strategies, to feel a sense of efficacy and power, and to put pressure on their children for achievement. Their homes tended to be less crowded, and the mothers participated fairly heavily in out-of-home activities. All these characteristics, as this study repeatedly suggests, enhance the child's development of cognitive ability.

When Table III-6 is examined for the relationship between the child's behavior and the home resources factor, the impact of rich utilization of home resources is underlined. Children from relatively rich environments did well on the Block Sorting task, gave more scorable responses and fewer nonverbal responses to the Sigel conceptual sorting task, and tended to receive higher Binet IQ scores. The children's behavior in the Block Sorting teaching situation appears uncorrelated with home resources until sex differences are examined. Then it is seen that the behavior score for girls is significantly correlated with home resources, whereas the boys' score is not. The same is true for IQ: there is a strong correlation between girls' IQ and use of home resources, but effectively no correlation for boys. The suggestion that girls' IQ and behavior may be more influenced by the maternal environment is strengthened when the relationship of the mothers' attitudes to use of home resources is examined. There is a strikingly greater correlation for girls' mothers than for boys' mothers between use of home resources and attitudes of optimism, efficacy, and pressure for achievement; girls' mothers are also more likely to use personal and subjective appeals in guiding behavior. These associations suggest strongly that sex differences must be further investigated if the relationship of home resources to educability is to be understood.

Orientation to the Community

Understanding the linkages between individual behavior and social structure requires understanding the extent to which interaction between family and community has consequences for the development of the individual. Both formal and informal contacts with others are valuable sources of information, attitudes, and values, and they bring to a family a perspective on community norms and various other matters of concern. The purpose that such interaction serves in reinforcing one's perception of his role in the community and maintaining roles in the social system is discussed in a number of sociological writings (Gerth & Mills, 1946; Litwak, 1958, 1961, 1966; Ogburn, 1953; Parsons, 1949). In particular, there has been considerable debate over the view that a strong family system retards the growth of bureaucratic structures in the community. These issues are relevant to discussion of the interaction between school and family, particularly when families join in efforts to change the schools. The linkages between the family as an institution and other institutions in the community are discussed in detail by Litwak (1966). Understanding these linkages and the consequent administrative procedures needed to reach families effectively is important in planning programs of innovation and change.

For this study, however, the interaction of the family with the community through voluntary associations and social networks is relevant in two ways: first, is there evidence for an impact of extra-family interaction upon the behavior of the mother and on the cognitive growth of the children? and second, what are the implications of social isolation and alienation for theories of intervention in disadvantaged neighborhoods?

Unfortunately, the information available is more adequate for the mothers than for the fathers in our families. Data about the fathers come only from interviews with the mothers and have not been analyzed in detail. The information available on maternal behavior falls into two general categories: the degree of the mother's interaction with non-family persons and institutions in the community, and her attitudes toward her child's chances of success in the society.

Interaction with the Community

There are differences between social class levels in amount and kind of social interaction (Litwak, 1966; Warner & Lunt, 1941). In the white community, middle-class adults belong to more organizations, entertain in formal ways (dinner parties, cocktail parties, receptions, etc.) and are more likely to spend evenings out, as couples, with friends. In organizations in which both middle- and working-class persons participate, the positions of organizational responsibility and leadership are more likely to be filled by middle-class persons (Cohen & Hodges, 1963; Litwak, 1966; Wright & Hyman, 1958). These differences are reflected in our data on Negro mothers, although the information we have lacks the detail of some other studies of social behavior. Table III-7 shows the total number of organizational activities (voluntary associations) and the pattern of memberships in several different types of associations, for mothers in the four social status groups.

TABLE III-7

Social Status Differences in Mothers' Participation in Organizations in the Community*

	Social Status			
			Working Class	
			Unskilled	
	Middle Class	Skilled	Father Present	Father Absent
Mean Number of Out-of-Home Activities	3.0	1.5	1.2	0.5
Percent of Mothers Involved In:				
Social Groups	57.5	14.3	12.5	9.8
Community Groups	52.5	31.0	25.0	9.8
School Groups	55.0	38.1	25.0	14.6
Church Groups	37.5	35.7	20.0	4.9

* Differences between the middle-class and each of the three working-class groups are significant ($p \leq .001$ for each); differences between the father-absent group and each of the other two working-class groups are also significant ($p < .001$ and $p < .01$).

The pattern of class differences in membership is that found in other studies. Middle-class mothers are involved in many more activities than those in working-class groups, but a relatively marked differential also appears between the father-present and father-absent groups.

The greatest difference among the social status groups is found in the category of social groups: formally organized fraternal or private invitational social clubs; informally organized card-playing clubs, special interest or hobby groups, neighborhood clubs, cousins' clubs, family clubs, community or institution sponsored clubs. Community groups included nationally sponsored, administratively active groups such as YMCA, YWCA, Girl or Boy Scouts; B'nai B'rith or locally sponsored charity boards, city club, neighborhood improvement groups. School groups refer to those formally associated with the school, such as PTA, Mother's Club, PTO, Alumni Association, and to those informally associated with the school, such as education associations concerned with improving the school, general education, or specific curriculum. Less difference appeared among the social status groups in involvement in religious activities. In general, the three working-class groups have little contact with organizations in the community.

A more salient question is the relationship of the mother's social activity to both her behavior in interaction with her child and the cognitive performance of her child at the preschool level. The correlation coefficients that indicate these associations are shown in Table III-8. Since mothers' out-of-home activities is so highly associated with social status level, correlations are reported for the combined working-class groups with the middle class excluded from analysis. Correlation coefficients are significant ($p \leq .05$) for the total sample for all variables in Table III-8.

The pattern that emerges in this table is plausible: mother who interact more with the institutions of the community are less likely to use status-normative rationale, are more likely to monitor their child's response or anticipate his needs (as indicated by a greater tendency to show models on the Etch-a-Sketch), are more likely to engage the child effectively in positive ways, are characterized as both dominant and sociable on the Thurstone scales, feel less powerless with respect to the school and more optimistic about their chances to improve their lives. Their children manifest less problem behavior and perform better in both the semi-structured interaction and non-standard testing situations.

The specific mechanism by which interaction in the community affects this cluster of behavior is not clear from correlations; it may be part of a more general orientation. The data are congruent, however, with the concept of linkages between family interaction and the mother's tendency to see herself as an effective, active member of the community. A more convincing test of the effect of participating in community institutions would be to increase experimentally the participation of women who have little community interaction in order to see if significant elements of interaction with their children would be affected.

Another type of data on interaction with the community and use of its resources comes from questions asked of these mothers about the local library facilities (Table III-9). There was little difference among the four groups in response to the question of the library's location. There was considerable difference, however, in response to questions about use of the library. The largest difference appears between the middle-class group and the three other groups. This suggests that it is not the ostensible availability of resources or knowledge about this particular resource in the community that differentiates the groups, but the practical availability of the library and motivation to use it.

TABLE III-8

Correlation of Mother's Out-of-Home Activities
with Other Demographic, Maternal,
and Child Variables*
(Three Working-Class Groups Only)

Variable	
Mother's Age	.18
Mother's Length of Residence in Chicago	.14
Rooms per Person	.10
Availability and Use of Home Resources (low score = rich)	-.39
Use of Reading Material by Child with Adult (low score = frequent use)	-.12
Maternal Support toward Child (low score = high support)	-.22
Interviewer's Rating of Mother's Cooperativeness (low score = very cooperative)	-.15
First Day: % Imperative	-.18
First Day: % Status-normative	-.20
School-Peer: % Personal-subjective	.13
School-Peer: % Status-normative	-.15
Number of Models Mother Shows Child (Etch-a-Sketch)	.26
Mother's Tendency to Praise Child (Block Sorting Task) (low score = high tendency)	-.14
Mother's Tendency to Praise Child (Etch-a-Sketch) (low score = high tendency)	-.15
Maternal Requests for Block Placement	-.10
Praise and Engagement during Interaction (low score = high use)	-.18
Maternal Orientation in Interaction (low score = maximal orientation)	-.10
Mother's Description of Mother-Teacher Relationship (low score = positive relationship)	-.10
Personal Optimism (low score = high optimism)	-.18
"Powerlessness" (low score = agree)	.24
Language Factor Score (low score = high elaboration)	-.22
WAIS Verbal IQ	.29
WISC Mazes	.15
Thurstone Personal Preference Record: Dominant	.29
Thurstone Personal Preference Record: Sociable	.21
Mother's Sigel: Average Reaction Time per Sort	-.10

TABLE III-8 - continued

Variable	
Toys Sorting Task Score (Child)	.13
Child's Non-meaningful Block Placement	-.15
Test Period Combination Score	-.11
Teaching Period Combination Score	-.14
Child's Errors (Block Sorting Task) (low score = high error rate)	.16
Binet IQ	.20
Child's Sigel: Scorable Responses	.22

* $p=.05$ when $\underline{r} \geq \pm.18$; $p=.01$ when $\underline{r} \geq \pm.25$

TABLE III-9

Use of Library Facilities,
Percent Distribution
by Social Status

	Social Status			
		Working Class		
	Middle Class	Skilled	Unskilled	
			Father Present	Father Absent
Does Mother Know where library is located?				
Yes	92.5	92.8	66.7	91.9
No	7.5	7.1	33.3	8.1
Does Mother have a library card?				
Yes	64.1	23.8	21.0	14.6
No	35.9	76.2	78.9	85.4
How often does Mother go to library?				
Never	30.0	59.5	69.2	62.5
Once a week	10.0	0.0	0.0	5.0
Once in two weeks	12.5	2.4	0.0	7.5
Once a month	22.5	11.9	7.7	12.5
Once in six months	22.5	23.8	10.2	7.5
Once a year	0.0	2.4	5.1	2.5
Less than once a year	2.5	0.0	7.7	2.5

Informal Social Activities

Social visiting, another type of interaction with the community, is less formal than participation in the groups described above. Maintained by affective rather than organizational ties, social visiting depends on personal rather than group criteria for evaluating the behavior of members (Parsons, 1955). Because the perspective gained from such contacts is personal rather than institutional, and less likely to be linked to authoritative sources of information and power, the purposes served by social visiting may be expected to be different from those served by more formal group membership. Some support of this notion comes from our data: there is much less difference between social status groups in social visiting, as shown in Table III-10, than was seen in the formal organizational activity data.

It would appear, although correlational data on social visiting are not available, that it is the formal contact rather than social exchange that makes for difference in maternal influences upon children.

TABLE III-10

Amount of Time per Week Mother Spends Visiting, Percentage Distribution by Social Status*

Number of Hours per Week	Social Status			
		Working Class		
			Unskilled	
	Middle Class	Skilled	Father Present	Father Absent
10 to 20 or more	17.5	14.6	15.0	15.0
5 to 10	12.5	19.5	20.0	30.0
2 to 5	37.5	56.1	35.0	27.5
less than 2	32.5	9.7	30.0	27.5

* Chi-square for this table is not significant ($p > .10$).

Attitudes of Optimism and Trust

Another expression of the mother's orientation toward her society is her expectation of opportunity and success for herself and for her child. Attitudes of optimism and confidence are shown by the mother's tendency to hold high standards of performance for her child. There is little point in pressing her child to succeed if she does not expect some significant reward for his efforts.

The mother's optimism was indicated by her response to the question: "If things continue as they are now, do you think you will have many (some, few, none) opportunities to improve your life?" Mothers from the middle-status group tended much more to reply that they would have such opportunities (Table III-11).

Relationships of mother's optimism to other measures of maternal behavior and to demographic data, for the combined working-class groups,

TABLE III-11

Social Status Differences in Mother's Personal Optimism

Percent of Mothers Responding:	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
1= many opportunities	72.5	26.2	18.4	19.5
2= some opportunities	25.0	54.8	57.9	43.9
3= few opportunities	2.5	16.7	7.9	31.7
4= no opportunities	0.0	2.4	15.8	4.9
Mean Score	1.3	2.0	2.2	2.2

* Differences between the middle-class and each of the three working-class groups are significant ($p < .001$); differences among the three working-class groups are not significant ($p > .10$).

are given in Table III-12. The mechanism through which the mother's feelings of personal optimism are translated into other forms of behavior and eventually influence, or are related to, the performance of the child, are most likely subtle, pervasive, and persistent. The mother who sees little opportunity for improving her own life is less likely to encourage her child to see the world as offering an array of opportunities. She is less likely to encourage achievement or an alertness to possibilities in the environment. Initiative and involvement which could promote learning are thus attenuated by feelings of powerlessness, and may be transformed into passivity and a reluctance to confront the environment.

Another indication of the orientation of mothers toward the external world comes from ratings of their openness and cooperation with the project's interviewers. On a 1 (very cooperative) to 5 (very uncooperative) scale, middle-class mothers were rated most cooperative (1.6) and were significantly different ($p \doteq .05$) from each of the working-class groups, which did not differ significantly from one another (skilled 2.1; unskilled father-present: 2.0; unskilled father-absent: 1.9).

The data on mothers' feelings of powerlessness in relation to the school are described in the chapter on socialization into the role of pupil and maternal attitudes toward the school (Chapter VIII). These data, while central to the topic of this chapter, will not be repeated here. They support the notion that feelings of effectiveness in relation to the school supply part of the environment which shapes educability and cognitive development. The educational attitudes scale indicating a feeling of powerlessness correlates with a number of maternal and child variables. This variable is associated with social status level, and Table III-13 accordingly shows the pattern of correlation for the three working-class groups, with the middle class excluded from analysis. Correlations for all variables in this table are significant ($p \leq .05$) for the total sample.

TABLE III-12

Correlation of Mother's Personal Optimism* with Demographic and Other Maternal Behavior Variables** (Three Working-Class Groups Only)

Number of People in the Home	.18
Rooms per Person	-.16
Availability and Use of Home Resources (low score = rich)	.33
Use of Reading Material by Child with Adult (low score = frequent use)	.23
Mother's Out-of-Home Activities	-.18
Can Child Play Unsupervised? (l= yes, 2= no)	.16
Global Achievement Pressure (low score = high pressure)	.27
School-Peer: % Personal-subjective	-.29
School-Peer: % Status-normative	.19
"Powerlessness" (low score = agree)	-.28
Rather Work than Go to School (low score = agree)	-.25
WAIS Verbal IQ	-.20
Mother's Sigel: Nonsort	.19
Mother's Sigel: Average Reaction Time per Sort	.28
Thrustone Personal Preference Record: Dominant	-.31
Thurstone Personal Preference Record: Sociable	-.21
Plutchik (E-I): Total Exploratory Items Liked	-.24
Successive Scanning ("Twenty Questions")	-.19

* low score = high optimism

** $p=.05$ when $\underline{r} \geq \pm.18$; $p=.01$ when $\underline{r} \geq \pm.25$

The mother's attempt to establish standards of achievement for her child and to motivate him to succeed may indicate a degree of sensitivity to the standards of the community. While this attitude on the part of the mother may not express a feeling of confidence, it does indicate a desire to respond to the norms of the community or to a social value defined by the mother. The measures in the data of the study revealing the mother's attitudes toward performance are thus relevant to a consideration of her orientation toward the community.

Mothers' pressure for achievement was rated by the home interviewer, on a scale from 1= great to 5= little. The mean rating for both the middle-class and skilled-working-class groups was 2.8; for the unskilled-father-present, 3.2; and for the father-absent group, 3.1. Differences between the middle-class and each of the unskilled working-class groups were significant (p=.01 and .03); and differences between the skilled and each of the unskilled working-class groups were also significant (p=.04 and .08).

TABLE III-13

Correlation of Mother's Attitude of "Powerlessness"* with Demographic, Maternal, and Child Behavior Variables** (Three Working-Class Groups Only)

Mother's Length of Residence in Chicago	.25
Number of People in the Home	-.27
Rooms per Person	.17
Availability and Use of Home Resources (low score = rich)	-.39
Use of Reading Material by Child with Adult (low score = frequent use)	-.34
Mother's Out-of-Home Activities	.24
Maternal Support toward Child (low score = high support)	-.28
Global Achievement Pressure (low score = high pressure)	-.36
First Day: % Imperative	-.32
First Day: % Status-normative	-.29
School-Peer: % Status-normative	-.16
Mastery: % Status-normative	-.18
Mastery: % Personal-subjective	.24
Verbal Task Interaction	.13
Number of Specific Turning Directions (Etch-a-Sketch)	.22
Specificity of Maternal Feedback in Block Sorting Task (low score = high specificity)	-.30
Maternal Orientation in Interaction (low score = maximal orientation)	-.25
Specificity of Maternal Instructions during Interaction (low score = high specificity)	-.24
Mother's Estimate of Child's Class Standing upon School Entrance (low score = first in class)	-.24
Etch-a-Sketch Score	.20
Toys Sorting Task Score (Child)	.20
Non-meaningful Block Placement (Child)	-.23
Test Period Inhibition (Child)	-.18
Test Period Combination Score (Child)	-.25
Child's Use of Correct Labels	.27
Activity Factor (Binet) (low score = optimal behavior)	-.28
Optimal Behavior during Testing (Binet General Factor)	.18

* low score = agree

** For the total sample, p=.05 when $\underline{r} \geq \pm.16$
p=.01 when $\underline{r} \geq \pm.21$

For the working-class groups, p=.05 when $\underline{r} \geq \pm.18$
p=.01 when $\underline{r} \geq \pm.25$

These attitudes are related to the child's performance as well as to measures of maternal behavior. The relevance of maternal pressure for achievement for the child's performance has been discussed in a number of papers and will not be reviewed here (Atkinson, 1958; Heckhausen, 1967; Rosen, 1961). The ratings of the working-class mothers' pressure for achievement correlate with a number of other measures, as shown in Table III-14.

Correlations for all variables reported here are significant ($p \leq .05$) for the total sample.

TABLE III-14

Correlation of Mother's Global Achievement Pressure*
with Demographic, Maternal, and Child Variables**
(Three Working-Class Groups Only)

Number of People in the Home	.25
Rooms per Person	-.18
Availability and Use of Home Resources (low score = rich)	.38
Use of Reading Material by Child with Adult (low score = frequent use)	.32
Amount of Visiting per Week (low score = many hours)	.20
Rating of Mother's Attitude toward Self-Reliance (low score = demands, encourages)	.18
Maternal Support toward Child	.39
First Day: % Imperative	.21
First Day: % Status-normative	.21
School-Peer: % Status-normative	.16
School-Peer: % Irrelevant	-.19
Verbal Task Interaction	-.14
Mother's Use of Etch-a-Sketch Practice Period (low score = optimal use)	.18
Number of Specific Turning Directions (Etch-a-Sketch)	-.19
Mother's Tendency to Praise Child (Block Sorting Task) (low score = high tendency)	.11
Praise and Engagement during Interaction (low score = high use)	.12
Specificity of Maternal Feedback in Block Sorting Task (low score = high specificity)	.19
Specificity of Maternal Instructions during Interaction (low score = high specificity)	.16
Difference between Mother's Aspiration and Expectation for Child's Educational Achievement	.19
Mother's Estimate of Child's Class Standing upon School Entrance (low score = first in class)	.26
Personal Optimism (low score = high optimism)	.27

TABLE III-14 - continued

Mother: Rather Work than Go to School (low score = agree)	-.25
"Powerlessness" (low score = agree)	-.36
"More Traditional Education" (low score = agree)	-.22
Language Factor Score (low score = elaborated language)	.22
WAIS Verbal IQ	-.35
Thurstone Personal Preference Record: Vigorous	-.24
Thurstone Personal Preference Record: Dominant	-.21
Thurstone Personal Preference Record: Sociable	-.19
Mother's Sigel: Average Reaction Time per Sort	.23
Mother's Sigel: Average Number of Figures per Sort	-.29
Plutchik (E-I): Total Exploratory Items Liked	-.24
Successive Scanning ("Twenty Questions")	-.20
Constraining ("Twenty Questions")	-.17
Spuriously Successful Block Placement (Child)	.24
Child's Use of Correct Labels in Block Sorting	-.13
Toys Sorting Task Score	-.18
Binet IQ	-.18
Child's Sigel: Scorable Responses	-.14
Activity Factor (Binet) (low score = optimal behavior)	.12
Optimal Behavior during Testing (Binet General Factor)	-.17

* low score = high pressure

** p=.05 when $r \geq \pm .18$; p=.01 when $r \geq \pm .25$

Summary and Conclusions

This chapter has presented evidence of dynamic interaction between the family environment, maternal behavior, and children's cognitive development. When family structure and circumstances were examined, it was found that the degree of crowding in the home apparently influences maternal behavior. The mother who has a relatively large number of persons in the home tends to be more status-oriented in her control strategies, to spend less time reading to her children, to show less warmth and support, to feel relatively powerless in dealing with the school, to express greater difference between her aspirations for her child and what she expects he will accomplish, and to exert less pressure for achievement on her child. These maternal behaviors have frequently been singled out in this study as behaviors tending to interfere with the child's cognitive development. Additional support is given to this notion in the finding that children from more crowded homes tend to show greater inhibition and less involvement in the interaction situation.

Other elements of family structure and circumstance were not, however, found to be significantly correlated to maternal behavior on our research measures. There was relatively little difference in the performance of mothers (or of children) from father-absent and father-present families; the mother's age also was only slightly associated with other measures, although there was a suggestion that women may not acquire more effective techniques with age. The effects of private housing vs. public housing were neither striking nor consistent. Birth order and sex of the child both seemed unrelated to maternal behavior.

When the utilization of home resources was examined, associations were found between maternal behavior and the degree to which advantage was taken of potential home resources. Mothers who made rich use of home resources tended to have fairly high personal optimism, to use personal-subjective control strategies, to feel a sense of efficacy and power, and to put pressure on their children for achievement. These mothers also participated fairly heavily in out-of-home activities. Their children were likely to perform better on the Block Sorting task and the Sigel measures of conceptual styles. Some sex differences appeared in both maternal and child measures; the data, however, were insufficient to permit more than the strong suggestion that sex differences must be further investigated if the relationship of family environment to educability is to be understood. (Further analysis of sex differences is found in the follow-up report.)

Family environment also includes orientation to the community, in particular, the degree of the mother's interaction with non-family persons and institutions, and her attitudes toward her child's chances of success. Social status differences were found in the pattern of out-of-home activities: middle-class mothers were involved in many more organizations in the community than were working-class mothers; a relatively marked differential also appeared between the father-present and father-absent group. The relationship for working-class mothers of social activity to maternal behavior and the child's cognitive performance was examined; it was found that mothers who interact more with the institutions of the community are less likely to use status-normative rationales, are more likely to monitor their child's responses or anticipate his needs, are more likely to engage the child effectively in positive ways, feel less powerless with respect to the school and more optimistic about their chances to improve their lives. And again, their children manifest less problem behavior and perform better in the interaction and testing situations.

From these results it seems that the mother's position in the social class hierarchy is important in predicting the degree of her interaction with the community, her treatment of her child, and her child's behavior. The implications of social class differences are explored in other chapters; at this point it is most important to note that even within a relatively restricted social class range (the three working-class groups) there are significant relationships between the degree of interaction with the community and the mother's behavior. The specific mechanism by which active community participation affects the cluster of maternal behaviors cannot be determined from the available data; the data are congruent, however, with the notion that the mother's tendency to see herself as an effective, active member of the community is closely linked to patterns of family interaction. It may well be that involvement in the community reflects attitudes of optimism and confidence that carry over into the mother-child relationship as well.

When the mother's feeling of optimism about her life chances was examined, significant relationships were found to her use of home resources, her out-of-home activities, her sense of effectiveness, and her pressure on the child for achievement. Mothers with a low sense of "powerlessness" and a high degree of pressure for achievement showed a range of behaviors found in this study to enhance the child's performance. These mothers, for example, tended to use personal-subjective rather than status-normative control strategies, and to give effective orientation, instructions, and feedback in the teaching tasks. Their children's behavior and performance also tended to be better.

Our finding of an apparently dynamic relationship between family environment, maternal behavior, and children's performance contains an implication for future intervention programs. We have suggested that the mother's sense of effectiveness in relationship to the social environment is a major influence on family interactions and the child's subsequent cognitive development. If this is indeed so, then means should be devised to promote mothers' interaction with the community, encouraging active membership in voluntary associations and full use of both community and home resources. Devising programs to resist alienation, to resist the tendency to turn away from the community, may in time greatly increase children's educability.

CHAPTER IV

MATERNAL CONTROL STRATEGIES AND COGNITIVE PROCESSES

A central component of a hierarchical socioeconomic system is the unequal distribution of power among members in different positions of prestige, wealth, and occupational status Adults of low status in the society have less share in policy making and planning, whether on the job, in educational activities, or in the operation of programs of welfare and economic opportunity designed especially for the poor. This relative powerlessness is thus a feature of the life of working-class urban adults, particularly those who belong to minority groups.

The exercise of power and control in the society at points of contact and exchange between organization and individuals provides a network of channels of communication. In these exchanges the roles of participants are defined, self-concept is shaped, and verbal mediation of their interaction is encouraged or discouraged. These social transactions facilitate or inhibit thought processes essential to making and implementing decisions in the operation of a social system.

The point of view taken in this report is that the nature of the control system within which an individual acts and to which he is subject influences the extent and complexity of communication and thought that are likely to be needed and used in various types of exchange (Bernstein, 1961b; Hess and Shipman, 1967). Also, the interactions established between adults and the institutions of the community, through their representatives, influence the types of communication that develop between adults and children within a family context. The family thus transmits to its children those modes of interaction which the adults experience with the outside world. These modes of interaction have linguistic and other cognitive consequences for the child; they also carry implications of worth and esteem that begin very early to define the child's place in the system and the range of alternatives open to him. These interrelationships thus act to limit or expand the child's roles and his language in service of these roles, and they have specific consequences for his definition of himself as, for example, a pupil in the school in relation to the authority of the teacher and other members of the educational institution This aspect of the socializing process is discussed in more detail in Chapter VIII.

In line with this point of view, one of the central aims of the study was to identify and examine the verbal and nonverbal maneuvers by which the mother regulates the behavior of her young child. These regulatory acts are an important part of the socialization of cognitive abilities and are particularly significant in orienting the child toward cues and figures to which he should attend and respond in his growing perceptual and conceptual world. In short, regulatory behavior by the mother identifies for the child the information, in the broadest sense, which he should regard as salient. In this chapter we will present concepts and data which in our view relate maternal control to the cognitive and behavioral performance of young children.

The operations of a young child's mind which are usually described as cognitive are not easily distinguished from affective and other presumably non-intellectual activities. Indeed, the distinction between affective and cognitive processes in a preschool child is largely artificial, so closely bound together are the initiatory and responsive behaviors of the child. This global and relatively undifferentiated aspect of the young child's mental processes has a particular significance: it means that the behavior of the mother in a variety of interactional areas is likely to affect in some way the child's cognitive growth and patterning. Thus, maternal behavior of quite disparate kinds (language, affect, control) is involved in the development of the styles with which the child approaches the world, perceives the information it presents, and attempts to affect it.

In this chapter we will argue that a significant dimension of maternal behavior, so far as cognitive development of the child is concerned, is the type of control that the mother exercises over the child, and that the pattern of maternal control she adopts has cognitive consequences quite apart from the specific intellectual elements involved in verbal interaction. It has been recognized for many years that the dimension of control-autonomy is a significant axis of exchange in family dyads, especially in mother-child relationships (Baldwin, Kalhorn, & Breese, 1949; Schaefer, 1959; Straus, 1962) The analysis of maternal control in psychological research literature typically deals with degree of control rather than with control strategies. This differentiation is significant for a study of the effects of control behavior upon children's thought processes. Traditional studies of amount of parental control have been concerned with concepts of discipline, autonomy, democracy in the home, and other similar aspects: research and theory available at the present time of problems of control deal primarily with interpersonal and affective relationships between parent and child. The focus of this study was upon the cognitive consequences for the child of maternal behavior which attempts to regulate his behavior. However, the more significant distinction between the approach described here and previous studies is that the types of control strategies rather than the degree of restriction or regulation is the focus of research attention. This aspect of mother-child interaction has received relatively little attention in studies of authority or in studies of cognitive development.

Among the women of our research group, there were clear differences in patterns of control exercised upon the child. These approaches were manifested in the mother's tendency to use certain types of appeal as the basis for disciplinary or control maneuvers. For example, the mothers of our groups could be categorized by the extent to which they relied upon norms or status as a basis for control or appeal to the child. A status-oriented mother presents rules in an assigned manner where compliance is the only rule-following possibility. In this situation the role of power in interaction between mother and child is more obvious and, indeed, coercion and defiance are likely interactional possibilities. A status-oriented mother uses a more rigid learning and teaching model in which compliance rather than rationale is stressed. In other families the norms of the group or the society are used less as a basis for control, and alternatives are selected with attention to the qualities and reactions of the persons involved.

Strategies of Maternal Control

We can distinguish several types of maternal control strategies which reflect the approach described above. In the child's interaction with the mother he learns to respond to discipline or control on the basis of three different types of appeal. These appeals are expressed in the mothers' use of requesting, suggesting, arguing, commanding, pleading, scolding, punishing, and other behaviors to regulate their children's actions. Some mothers use all of these techniques, with preference for one above the other. The significance of these control strategies lies in the type of response that the mother's strategy demands from the child.

Strategies Based on Appeal to Norms, Status, Rules, and Regulations

The essential element of this strategy is that it accepts the status quo as appropriate and unquestionable, using such statements as "You'll do that because I said so," or "Don't do that--girls don't act that way," or "Mind the teacher and do what you are told." Such statements are based on the argument that one should accept without question the norms of the system and the position or status of members in it. For example, teachers are to be obeyed because they are teachers. This type of control is useful and necessary on certain occasions. It is essential to inform the child about the authority structure and rules of the family, of the school, and later of the structure of more complex institutions--the army, the corporation, etc. However, this type of control asks for no thought or reflection on the part of the child. He merely has to respond with compliance, not with understanding. He must obey, not consider, discriminate, anticipate, or compare. If this type of control is used exclusively or almost exclusively with a child, his orientation is likely to be one of conforming (or rebelling), rather than of attempting to comprehend the rules and the system in other terms. This type of control defines his role as passive, waiting to be told, accepting the instructions he is given without investigating or questioning. It may lead to a passive learning style if used by a family and, subsequently, by the teacher at school.

Strategies Based on Subjective Appeal to Internal States of the Child or Others

In this type of control, the mother calls attention to feelings and other internal reactions, using such phrases as "How do you think your sister will feel if you do that?" or "You've hurt Bobby's feelings," or "The other girls won't like you if you . . ." or "When you do that, it makes me very sad," or "The teacher has a hard job taking care of so many kids; how would you feel if you were the teacher and the kids didn't mind?". These statements call the child's attention not to the rules so much as to the effects of his behavior on other persons and on himself. As a style of control, it orients the child toward the roles of other persons, asking him to put himself in their place--to role-play. This is a more complex cognitive process and one which asks the child to be attentive to incoming cues from the environment, rather than to memorize a rule of behavior It induces and encourages a different learning style--less passive, more alert to cues from peers and authority figures, more able to see a situation from several vantage points

Strategies Based on Rational Arguments or Future Consequences of Behavior

This type of control calls the child's attention not to norms and feelings but to the eventual outcome or effects of the behavior. It is based on a rationale of cause and effect and on the notion that what the child does at present has a future result It is thus much more complex than the first two strategies, for it asks the child to project himself into the future, sometimes to another place, and to reflect on the long range effects of his behavior. This type of control requires the child to reflect upon the consequences of his action in relation to alternative actions in order to make a decision based on logical (no matter how simple) cause-effect considerations. For example, if a child asks to play with a classmate after school and the mother responds, "Will you have enough time to do your homework?" or a similar comment, the child is asked to weigh the consequences of alternative actions and to regulate his own behavior in accordance with a more complex plan than would be the case if the mother simply denied the request without linking her response to other considerations she had in mind. This type of regulation thus gives the child both a way to internalize control of a cognitive nature and general guidelines which he may himself apply to new situations.

Effects of Strategies on Family Interaction and Child's Behavior

Regulatory transactions within the family may be seen as mutual interactions in which the actions and words of the mother and the contingent responses of the child establish for the child strategies for selecting and processing information in the immediate environment The contingencies that emerge in these interactive patterns also apply from child to parent, in that the mother's responses to the behavior of the child may shape, inhibit, modify, reinforce, or reorganize the interpretation of stimuli he receives The child also learns roles which relate him to authority figures in terms of these information-processing strategies. Families oriented to norms and status appeal induce behavior and roles in which authority figures are given prominence in the interaction as sources of cues to guide behavior The prominence of power considerations in the relationship is more apparent than in more cognitive-rational or person-oriented families Indeed, in attempting direct control in a specific situation, status-oriented parents have fewer alternatives to the use of power than do parents with other orientations

These three regulatory strategies lead to complementary orientations on the part of children. In status, norm-centered approaches, it seems likely that the child learns to attend to authority figures; in the person-oriented regulation systems, possibly the child is directed toward expressive, subjective responses in others and is more responsive to interpersonal aspects of behavior; in the cognitive-rational approach the child is more likely to be oriented toward logical principles. Although there is obvious overlap among these three orientations, they may be regarded as representing different areas of emphasis in the environment.

Social Status Differences in Types of Maternal Control

Our measures of maternal control are based on several different sources of data, all of which were generated in testing and interview situations. We do not have observations of mother-child behavior under natural conditions in the home, and therefore our sources of information must be regarded as estimates, no matter how carefully worked out the situation and the scales employed. This is not to say that our situation is unusual; the difficulty in obtaining naturalistic data is one of the persistent problems of research on family interaction.

The data to be presented here are organized in two sections. The first of these deals with measures relating to two of the three types of regulatory appeal--status-normative and personal-subjective. Only a few responses occurred in the cognitive-rational category, primarily because of a lack of techniques for eliciting such replies; no data will be presented on this type of control appeal.

Status-normative Orientation

Measures

Information about the tendency of mothers to use this type of appeal comes from two separate and different types of semi-structured verbal responses--the First Day question, and Mastery and School-Peer Situations.

Imperative (First Day). One of the structured techniques was to ask the mother to indicate what she would tell her child on the first day of school before he left the home. Responses to this question were grouped into several categories (see Appendix D and Chapter VIII for details of scoring). The Imperative category includes maternal responses dealing with obedience and achievement behaviors, conveyed to the child as an unqualified command: the child must or must not do this or that. The command is generally given without naming a source of authority or power, although a source may be implied. Specific commands such as "Sit down" or "Don't holler" are included here. A source of authority may be named in giving the command; this authority might be a person such as the teacher, a group such as the other children, or an institution such as the school or "they" (e.g., "Mind the teacher;" "Do what they say"). The relationship between the child and the authority is, however, explicit.

Status-normative (First Day). For the First Day measure only, a Status-oriented score was obtained by summing Imperative commands and those Instructive statements which contained an appeal to either status or norms. Obedience and achievement commands in the First Day protocols were scored as Instructive when the hierarchical relationship between child and authority was explicit, or when the mother provided some other rationale for the behavior demanded.

Status-normative (Mastery). This variable was defined by maternal responses to a number of hypothetical situations in which the child has committed some minor infraction, such as spilling soup on his clothes, spilling paint on a rug, taking food off shelves in a supermarket, etc. (See Appendix E.) The maternal responses to each were categorized as Status-normative if the appeal to the child was based on expectations of correct or "proper" behavior toward the role or property of others, including responses which defined and justified expected behavior in terms of the relative or absolute status of the child. Expectations for behavior were phrased as commands; they were imperative and absolute. The mother commanded absolute obedience to social norms and institutionalized rules; the command was justified, if at all, by the relative status of the persons involved or by the norms and rules themselves. The status quo was supported and upheld. The Status-normative (Mastery) score is the percent of situations for which the mother gave primarily status-oriented responses.

Status-normative (School-Peer). This variable was defined by maternal responses to eight hypothetical situations which might occur in school and in which conflict between the child and the teacher, his peers, or the institutional demands of the school arises. In half the cases, the child was clearly in the wrong; in the other, he was the innocent victim of another's failure to meet expected standards of behavior. In each instance, the mother was asked to indicate what she would do in response to the situation.

The mother's responses were scored according to two schemes; in one, similar to scoring for the Mastery Situations, each item was scored for the single major appeal used in her statement of what she would do if her child created such trouble or was the victim of another's misbehavior. The three basic types of appeal for which the responses were scored were: status-normative, personal-subjective, and cognitive-rational. Relatively few of the mothers' responses were appeals to the consequences of the child's actions, and this category is not reported here. The situations that the mother was asked to discuss dealt with her response to an act of misbehavior or injustice which had already occurred. The appeal to consequences would more typically come before an event anticipated by the mother; the format of the situations--both for Mastery and for School-Peer--thus may have precluded this type of response. This seems to be the more likely explanation for the low frequency of this type of appeal, although it also seems possible that this type of control strategy is used less with very young children than with children in the preadolescent and adolescent years. The general definitions as used for this task and for other measures are given in Appendix F. A fourth category was used when the mother's response was too vague to be scored, irrelevant, or otherwise inappropriate to the question asked.

In the second scoring procedure, similar to that used for the First Day question, each unit of a response was scored as status- or person-oriented, or as undefinable; each situation then received a percentage score for status and person orientation, and the full response with all eight situations combined was scored for percentages of status and person orientation.

The Status-normative (School-Peer) variable reported here is the percentage of responses, across situations, in which the mother commands absolute obedience to social norms and institutionalized rules; the command is justified, if at all, by the relative status of the persons involved or by the norms and rules themselves. The status quo is supported and upheld.

The data on these measures will be summarized and organized to respond to two questions: first, what are the differences among the several social status groups and other groupings in our data?, and second, what is the relationship of these measures of maternal control to cognitive performance of the mother and cognitive measures on the child?

Social Status Differences in Status-normative Orientation

The relative use of responses on the several techniques which were rated as Status-normative are shown in Table IV-1. The most apparent disparity was between the middle-class mothers and the other three groups; there were some differences among the three working-class groups, but these were usually smaller than the gap that separates them all from the high status group. Contrasts between the middle-class and each of the three lower-class groups were significant ($p < .01$) for all four scores; differences among the three lower-class groups on these scores were not significant ($p > .10$) except for one score: mothers in the unskilled-father-absent group had significantly ($p < .01$) higher status scores on the School-Peer instrument than did either the skilled or unskilled or unskilled-father-present groups.

TABLE IV-1

Use of Status-normative Control Strategies,
by Social Status
(Mean Percent)

Measure	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
First Day:				
Imperative	14.9	48.2	45.7	46.9
Status	22.3	51.9	46.5	49.5
Mastery:				
Status	23.9	47.0	46.2	42.7
School-Peer:				
Status	27.8	36.9	41.7	50.8

From these data it appears that working-class Negro mothers tend, on the average, to be much more likely to use status-normative types of control in comparison with middle-class Negro mothers. This finding is consistent with our argument that the control systems within a family reflect the position of the family within the social structure of the society.

Personal-subjective Orientation

Measures

Our data on the use of personal-subjective control strategies by mothers of our group come from the same protocols described above. They are:

Personal-subjective (Mastery). This measure is the percent of situations in which the mother's response clearly takes into account the child's unique personal attributes, his feelings, wishes, and motivation, and in which the mother attempts to explain the feelings of others and encourages the child to view the meaning and results of his behavior from another perspective (e.g., as if he were the injured or wronged party).

Personal-subjective (School-Peer). This variable is the percent of the mother's responses, across situations, which encouraged the child to empathize with another's feelings and/or considered the child's feelings in explaining his behavior. The justification for any action taken includes some statement of the subjective states of the persons involved and the necessity of taking feelings into account.

Social Status Differences in Personal-subjective Orientation

The differences among the status groups in offering this type of response are shown in Table IV-2. Significant differences ($p < .01$) were obtained on the Mastery Situations for contrasts between middle-class mothers and mothers in each of the three working-class groups. On the School-Peer instrument, significant ($p < .01$) differences were obtained between middle-class and unskilled, both father-present and father-absent, and between skilled working-class and father-absent groups. There were no other significant contrasts on either instrument (all $p > .10$).

TABLE IV-2

Use of Personal-subjective Control Strategies, by Social Status (Mean Percent)

Measure	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Mastery Situations	63.2	43.9	40.8	48.1
School-Peer Situations	36.8	31.6	26.4	21.9

The social status differences in orientation toward persons are particularly striking when compared with differences among these groups on status-normative orientation (Table IV-1). Indeed, the distinguishing characteristic seems not to be the degree of status orientation so much as the extent to which this approach is modified and qualified by more internally oriented considerations. The profile of class differences is altered if actual number of status or imperative statements, rather than percentages, is noted. In mean number, the four groups followed the pattern shown in Table IV-3.

TABLE IV-3

Use of Imperative and Status responses, by Social Status
(Mean Number of Responses)

Measure	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
First Day:				
Imperative	1.3	3.2	2.5	3.1
Status	2.0	3.5	2.5	3.3
Mastery:				
Status	2.1	4.3	4.1	3.8
School-Peer:				
Status	7.5	7.3	7.3	8.2

The relative lack of social status differences in sheer number of status-normative statements contrasted with the dramatic difference between middle class and working class in percent usage of this strategy--is due, of course, to differences in length of responses. Middle-class mothers gave about the same number of status-normative statements as did working-class mothers, but they also gave many personal-subjective responses, and the length of their responses was greater. Working-class mothers' responses tended to contain fewer units, and most of those units were of the status-normative type. Whether use of a middle-class interviewer affected the responsiveness of mothers from different social status levels and consequent differential occurrence of person-oriented responses, is not known. It might still be argued, however, that it is not the strictness of the control system, but the attempt by the mother to base demands upon individually-oriented arguments, which determines its impact upon the child.

Responses Providing a Rationale

Measure

The data from the study which are most clearly differentiated from imperative categories are those which offer a rationale for the injunction or command given the child on the First Day question. The categories for analysis of these protocols (described in greater detail in Appendix D and in Chapter VIII) include a grouping called *Instructive*. As opposed to *Imperative* responses, which include only unqualified commands with no rationale, Instructive responses provide some rationale--an explicit appeal to status-relationships, to normative expectations, or to personal considerations--for the behavior expected of the child. They allow, at least in theory, some choice and discretion on his part.

Social Status Differences in Instructive Responses

Use of this category by the four groups of mothers is shown in Table IV-4. Differences between the middle-class and the two unskilled-working-class groups were significant ($p < .05$); all other contrasts were insignificant ($p > .20$).

TABLE IV-4

Use of Instructive Responses (First Day),
by Social Status
(Mean Percent)

Measure	Social Status			
		Working Class		
	Middle Class	Skilled	Unskilled	
			Father Present	Father Absent
Instructive	8.7	4.6	1.6	3.1
Ratio of Imperative to Instructive Responses	1.7	10.5	27.8	15.1

Although the techniques for obtaining information about maternal control strategies have not been developed to the point of effectiveness that we might wish, the pattern of responses in Tables IV-1, IV-2, and IV-4 is evidence that considerable differences exist among mothers from different social status levels. These are average differences, of course; individual variation is marked among mothers within any status group. In general, however, the pattern of response follows that found in the work of other investigators who have examined parental values (Hyman, 1953; Inkeles, 1960; Kohn, 1963), and those who have observed mother-child interactions (Kamii and Radin, 1967; Walters, Connor, and Zunich, 1964). This pattern of maternal behavior is also related to a wider cluster of attitudes and behaviors observed in our structured interaction situations. The types of regulatory behavior used by the mother are related to other features of her attitudes and behavior. This is to be expected, if the postulated linkages between social structure and behavior exist.

Relationship of Maternal Control Strategies to Other Maternal Behavior

An examination of the correlations between the control measures and other maternal behavior provides a context in which the control measures may be more completely understood. The correlations are shown in Table IV-5. The most obvious and consistent pattern observed in these correlations is that the Status-normative scores, as contrasted with Personal-subjective and Instructive scores, are correlated in opposite directions with all variables. This phenomenon is due in part to the negative correlations obtained between the two types of control strategies. Correlations among the control strategies are, however, moderate. (Across tasks, they range from .11, $p > .05$, to .32, $p < .01$; although all are in the expected direction, only half of the correlations across tasks are significant at $p \leq .05$. It is only within tasks that highly significant correlations occur, due in large part to the use of percentages which preclude independence of scores.)

Significant correlations were obtained between high use of status-normative strategies and a variety of environmental and maternal attitude variables: physical crowding, limited availability and use of resources, few out-of-home activities for mother, and feelings of powerlessness and concerns with more traditional educational practices. Mothers who were high in use of status-normative strategies were low in language elaboration and IQ, showed relative lack of good teaching techniques in the structured interaction, and were low in positive affect toward the child both at home and during the interaction. Opposite relationships were obtained for mothers high in use of personal-subjective and instructive strategies.

Relationship of Types of Maternal Control to Children's Behavior

The rationale for analyzing maternal control strategies includes the hypothesis that certain areas of children's behavior are related to the mothers' regulatory techniques. The child's responses--both interpersonal and cognitive, in the sense of problem solving and manipulation of symbols-- which are elicited by the mother's behavior are likely to be pervasive, although the measuring instruments used in the project can indicate only a few of the patterns associated with maternal control. Estimated by our measures, the effects of a given style of maternal behavior upon the child are not likely to be specific because the maternal behavior involved is complex; the control strategies of mothers are a mixture of different appeals expressed in a variety of contexts. However, in comparison with mothers who use subjective, person-oriented appeals or rationales, the general effect of the imperative or normative strategy, with its typically more restricted linguistic code, is to depress the child's tendency to engage in reflective, thoughtful activity, and to discourage verbal mediation and facility. In addition, the relationships children establish with other adults (e.g., testers, teachers) apparently reflect the type of interpersonal relationship that grows out of the mother's behavior.

TABLE IV-5

Correlations Between Control Strategies and Other Maternal and Environmental Variables*

Other Maternal and Environmental Variables	Control Strategies						
	Status-normative				Personal-subjective		Instructive
	Imperative	Status-oriented					
	First Day	First Day	Mastery	School-Peer	Mastery	School-Peer	First Day
Number of persons in home	.24	.21	.09	.12	-.14	-.27	-.11
Ratio of rooms to persons	-.23	-.15	-.26	-.30	.21	.36	.28
Availability and use of home resources	-.41	-.35	-.33	-.38	.33	.34	.20
Ratio of children to adults	.36	.33	.26	.23	-.26	-.30	-.06
Number of mother's out-of-home activities	-.31	-.27	-.27	-.23	.23	.23	.15
Maternal support toward child (interviewer's rating)	-.37	-.33	-.23	-.26	.23	.23	.11
Personal optimism	-.26	-.21	-.15	-.27	.11	.28	.19
Powerlessness (ESI)	.33	.30	.26	.17	-.28	-.13	-.13

Traditional view of education (ES2)	.29	.26	.27	.13	-.23	-.04	-.15
Language elaboration	-.39	-.33	-.34	-.34	.30	.39	.19
WAIS IQ (Verbal)	-.48	-.41	-.42	-.40	.46	.32	.25
Number of models mother shows child (Etch-a-Sketch)	-.35	-.30	-.29	-.27	.32	.16	.16
Number of specific turning directions (Etch-a-Sketch)	-.28	-.24	-.31	-.18	.29	.18	.15
Praise in block sorting task	-.28	-.26	-.29	-.04	.28	-.00	.03
Praise in Etch-a-Sketch task	-.31	-.28	-.31	-.15	.27	.15	.11
Requests for block placement (block sorting task)	.22	.21	.10	.22	-.11	-.20	-.07
Affectionateness in interaction	-.26	-.23	-.27	-.11	.21	.04	.10
Use of praise and engagement in interaction	-.36	-.32	-.35	-.13	.35	.03	.11
Specificity of instructions in interaction	-.33	-.26	-.30	-.34	.30	.34	.25

*The signs of the coefficients indicate the direction of the relationship between the behaviors; $p < .05$ when $r \geq \pm.16$; $p < .01$ when $r \geq \pm.21$.

An examination of the correlations between types of regulatory behavior and children's performance (Tables IV-6 and IV-7) shows that a tendency for mothers to use status-normative regulatory techniques was associated with low performance in several areas. First, there was a significant negative correlation between Imperative responses on First Day protocols and the children's Stanford-Binet IQs. Imperative responses were also correlated negatively with the child's performance on the block sorting task, as indicated by both total score and the child's ability to give correct verbal responses (labels). The child's performance on the Sigel Sorting Task was also related to maternal preference for imperative or normative-based control, with children of high imperative mothers giving relatively more nonverbal responses and fewer scorable responses.

TABLE IV-6

Correlation Between Mother's Use of Status-normative Strategies and Measures of Children's Performance

	First Day Imperative	First Day Status	Mastery Status	School -Peer Status
Total score (block sorting)	-.30	-.22	-.24	-.27
Use of correct labels (block sorting)	-.30	-.24	-.22	-.23
Sigel: scorable responses	-.24	-.20	-.20	-.28
Sigel: nonverbal responses	.34	.30	.17	.19
Binet IQ	-.48	-.41	-.42	-.40
Optimal behavior during testing (Binet)	-.17	-.09	-.11	-.09
Non-meaningful block placement (block sorting)	20	.17	.23	.14

* $p < .05$ when $\underline{r} \geq \pm .16$; $p < .01$ when $\underline{r} \geq \pm .21$.

The relationship between the child's performance and status-normative responses on both the School-Peer and Mastery measures follows a generally similar pattern, even though the correlations between Imperative (First Day) and Status scores were not high (.26 for School-Peer, .30 for Mastery Situations).

Maternal behavior which relied more on rationales or appeals to personal-subjective considerations generally showed a relationship to children's performance in an opposite direction from the imperative measures. These more complex appeals show positive correlation with performance on the block sorting task, the Sigel sorting task, and the Stanford-Binet (Table IV-7).

TABLE IV-7

Correlations Between Mother's Use of Personal-subjective and Instructive Strategies and Measures of Children's Performance*

	Mastery Person	School-Peer Person	First Day Instructive
Total score (block sorting)	.17	.17	.30
Use of correct labels (block sorting)	.22	.20	.25
Sigel: scorable responses	.16	.23	.13
Sigel: nonverbal responses	-.07	-.12	-.16
Binet IQ	.24	.21	.17
Optimal behavior during testing (Binet)	.14	.06	.21
Non-meaningful block placement (block sorting)	-.21	-.22	-.12

* $p < .05$ when $\underline{r} \geq \pm .16$; $p < .01$ when $\underline{r} \geq \pm .21$.

Summary and Conclusions

Maternal responses to open-ended and semistructured questions dealing with hypothetical situations involving their four-year-old children were analyzed for the type of maneuvers used by the mother to regulate the child's behavior. Three types of control strategies had been postulated to be important to the child's cognitive development: status-normative, personal-subjective, and cognitive-rational. The first two occurred with sufficient frequency in maternal responses to permit scoring for relative use of one or the other. The latter type of strategy, an appeal to logical arguments and future consequences of behavior, occurred only rarely, but a related type of response, in which the mother provided a rationale for her demands, was obtained from one of the measures administered.

Social status differences were found in relative use of the two control strategies: middle-class mothers tended to use a much smaller percentage of status-normative statements and a larger percentage of personal-subjective statements than did mothers in any of the three working-class groups. And middle-class mothers tended to use a greater percentage of Instructive responses than did working-class mothers. Differences were significant only for contrasts between middle- and working-class mothers. The difference in sheer number of status-normative statements was not striking, the major difference between middle- and working-class mothers being whether their demands for obedience were tempered with explanations and personal appeals. Middle-class mothers tended, on the average, to offer an Instructive statement for every two absolute commands, while working-class mothers gave from ten to twenty-eight times as many absolute commands as Instructives.

These social status differences are highlighted by examining the relationship of maternal control strategies to other variables: use of status-normative appeals is significantly associated with a number of variables, including low availability and use of home resources, crowding, lack of out-of-home activities for mother, and maternal feelings of powerlessness. Use of personal-subjective and Instructive strategies is correlated in the opposite direction with these variables. these strategies are associated with high availability and use of resources, with fewer children per adult and more rooms per person, with maternal activities outside of the home, and with positive attitudes toward education and her life.

The different types of control strategies are related to performance measures in similar fashion: mothers who tend to use status-normative responses, as contrasted with those high in use of personal-subjective and Instructive strategies, tend to be low in language elaboration and verbal IQ, and to use relatively poor teaching techniques--both cognitive and affective--in interaction with their children.

Maternal control strategies are related to the child's performance, both cognitive and behavioral, on the block sorting task, Sigel sorting task, and Stanford-Binet. Typically, maternal use of status-normative strategies is associated with poor performance, while use of personal-subjective and Instructive strategies is associated with a high level of performance on these tasks.

The correlations of control strategies with children's performance were consistent in direction and degree, and present a picture of relationships congruent with that postulated to exist between maternal behavior and children's cognitive and behavioral performance. These results argue for the importance of including control strategies among measures of maternal behavior in any analysis of the influence of early experience on the development of cognitive processes in young children.

CHAPTER V

MOTHER-CHILD INTERACTION

In families of our study, the mother is the major socializing agent for her preschool child. Consequently, she continually functions as a teacher in their everyday interactions, whether or not she is aware of her teaching role. Much of the implicit curriculum to which the child is exposed in his preschool years is conveyed by the communications he receives from his mother.

Mother-child communication is, of course, an extremely complex activity, and it may be investigated fruitfully from a variety of approaches. The data in the preceding chapter, for example, are based on the free responses given by the mothers to questions about how they would handle hypothetical socialization problems. The responses of the mothers to the interview questions yield important information about the control strategies they use in socializing their children, so that the interview method is appropriate for the study of that aspect of mother-child communication. In the present chapter we will utilize information-processing theory to focus on the communication process itself, as observed in structured mother-child interaction situations designed specifically for this aspect of the research.

As the previous chapter has shown, mothers react differently to comparable socialization situations, attaching different meanings to them and consequently contrasting with one another in their responses to their children. However, even when two mothers react in the same way in attempting to communicate the same message to their children, they may still differ in their communication behavior and consequently have differential effects upon their children. These kinds of differences may be said to be in the process or methods of communication, rather than in the aims or content. In order to compare mothers in this aspect of communication behavior, it is necessary to eliminate differences in the aims of communication so that each mother attempts to teach the same content to her child. The mother-child interaction situations used in our research were designed precisely for this purpose: they were structured so that the information to be conveyed to the child was constant for all subjects, but each mother was free to use any means or techniques she desired in attempting to convey it.

The interaction revealed striking differences in the way mothers attempted to teach the same basic message or skill to their children and in their relative success in doing so. In attempting to account for these differences, we have examined a number of maternal teaching variables including language (variety, organization, and relevance), motivation techniques (methods used in attempting to get the child to want to learn or to be prepared to learn), ability to interpret the child's responses, and success in giving appropriate feedback in reaction to those responses. Effects observed in the children were also measured and were analyzed in relationship to the various maternal variables. These data will be discussed in the present chapter, and the argument will be developed that differences among mothers in these teaching variables not only affect the degree to which the children learn the intended message or meaning, but also affect their motivation in the learning situation and the kinds of learning strategies or habits they develop. Although some of the latter kinds of effects may be extraneous or even antithetical to a mother's intent as she teaches her child, they may occur as direct reactions to the way in which she teaches.

In any situation involving communication between two human beings, the problem of congruence of meaning may arise. The sender of a message must attempt to communicate the meaning which he intends through a variety of language media. Since such media are limited, the receiver does not always get a congruent message, and often a feedback chain or a series of reactive responses must be initiated until gradually, through a series of successive approximations, congruence of meaning is achieved.

When failures in communication occur and repeated attempts by the sender do not result in the receiver's attaining the desired meaning, frustration or other undesirable affective states may appear and interfere with the interaction. In the case of a mother teaching her young child, the opportunities for these extraneous effects are magnified because the child is in a strong affective relationship with the mother and because there is a clear-cut power differential in which the mother is in a position to make demands upon the child.

This combination of differential power and high affective involvement means that mother-child interaction is not simply an impersonal information exchange from a sender to a receiver, but instead is an emotionally charged interpersonal experience in which both parties are deeply involved. If in addition the interaction has achievement connotations, such as when the mother is attempting to teach in a deliberate instruction situation and the child is expected to demonstrate learning by performing the skill himself or by repeating the message back to the mother, the affective components of the situation are further enhanced. The interactions used in our research were of this type.

In the abstract, communication can be conveniently conceptualized in terms of variables such as clarity, efficiency, sequencing, etc. In communication involving a mother and her preschool child, however, the interpersonal and dynamic factors involved make the situation much more complex and difficult to conceptualize. Because of the child's limited fund of experience and skills, much more depends upon the mother in this situation than would depend upon the communicator in an interaction between two average adults. The mother can be less sure that her messages are being received in their intended meaning. Consequently, she must attempt to structure the situation so as to be able to gauge from the child's behavior or from appropriate questioning the degree to which he has understood and seems to be "getting the message."

Mothers attempting to teach their children in deliberate instruction situations differ considerably from one another in the kind of techniques that they use and the degree of success they achieve. This variety is partially due to differences in education, intelligence, and general experience which cause the mothers to differ in their repertoire of abilities and communication skills. These general factors tend to limit the range of techniques available to each mother, although many other factors are involved in determining the specific behavior which she uses in a given interaction with her child. Thus, some intercorrelation among separate variables is expected due to the influence of the general factors mentioned above, although the approach taken in this research emphasizes the variability within each mother's program as much as it does the consistency. Consequently, the attempt has been made to identify and measure separately several interaction variables for both the mother and the child.

Many of the maternal communication variables studied are aspects of information transmission or teaching. This aspect of mother-child communication has been given relatively little attention in previous research, but it is a primary focus of the present investigation. The mothers were coded on such variables as language specificity, completeness and clarity of presentation, and the sequential ordering of messages and concepts presented. Other aspects of information transmission involve the mothers' attempts to obtain feedback from the children and their own subsequent confirmatory or corrective feedback. In seeking feedback, the mothers may differ in their timing of feedback requests and also in the type of response requested (performance vs. process, physical movement vs. verbal response), while their confirmatory and corrective responses to the children may differ in frequency (amount of confirmation and negation), tone or direction (emphasis on reward of correct responses vs. punishment of errors), and specificity (informational content).

In addition to the information-transmission aspects just described, the behavior of mothers will also differ in the affective sphere. Maternal variables in the latter area have been more widely studied in previous research. Several reviews and factor analytic studies (Becker, 1964; Milton, 1958; Schaeffer and Bell, 1955), using sets of data that included a large number of maternal variables, have suggested that much of the variance of maternal behavior is subsumed under two orthogonal factors or dimensions. These factors, which have been of very similar composition in the separate studies, are usually referred to as warmth (love-hostility) and control (autonomy-control). Maternal behavior in these two areas is also studied in the present research, although the approach adopted here differs from previous studies in two ways. First, previous studies have ordinarily been based on mother-child interaction in an unstructured, free play situation. Our mother-child interactions were deliberate instruction situations in which the mother had to exercise considerable control over the child's behavior and in which constant face-to-face interaction was likely to increase the general intensity of affect. Consequently, the terms warmth and control in these interaction situations do not have quite the same meaning as they do when applied to general parental behavior in the home. The second major consideration differentiating the present research from earlier ones is our emphasis on the information-aspects of the mothers' communication. In effect, we are adding a third major dimension of maternal behavior, studying it not only in its own right but in its interaction with the factors previously mentioned. Thus maternal control is not merely a matter of permissiveness vs. strictness; it is approached as a complex factor which includes aspects both quantitative (to what degree does the mother obtain compliance with her wishes?) and qualitative (what methods does she use in attempting to do so?). In the teaching situation, the mother must usually do more than obtain compliance by controlling the child in the usual narrow sense of the word; she must instill a positive attitude of cooperation and interest in learning. She must motivate rather than merely control the child, and much of this is accomplished through behavior more closely identified with information transmission and warmth than through control as it is traditionally used in the coercive sense. In the realm of maternal warmth, the deliberate instruction situation raises the question of the degree to which the mother relates her affective responses to the child's achievement in learning the task. The affective responses of some mothers toward their children may vary little from situation to situation, while other mothers may vary their affective response to the child according to his success and cooperation. Affective responses may also have information-transmission aspects, since a given expression of warmth or hostility may also provide information (feedback) and reinforcement when it follows the task response of the child.

Important differences also occur among the children. Factors such as intelligence, interest in learning, and attention span make for differences among the children in their readiness for the task, and other factors appearing during the task itself affect the speed and completeness with which the child is able to learn it. In some children learning will be retarded or negated by the appearance of undesirable emotional or attitudinal states. Some children may be oriented primarily toward minimizing or avoiding failure, rather than toward striving to learn the task material. Frequently this will produce a lack of correspondence or congruence between the children's performance (overt responses) and the degree to which they have actually learned the task and are able to generalize it to a new situation (underlying cognitive process). In other children fear of failure may lead to response inhibition and attempts to escape or avoid the situation altogether. Still other children may find the task so unrewarding that they resist it, refusing to cooperate with the mother by listening to her teaching and responding when she requests it.

Procedures

Data were gathered through the observation and recording of specially designed mother-child interaction situations. Three separate situations were used. These included a relatively easy cognitive sorting task, a more difficult sorting task, and a task involving the copying of geometric designs. The tasks required each mother to teach the same content but allowed her complete freedom of time and method. The interactions were observed and tape recorded, and the transcripts were analyzed intensively to measure the mother's teaching and the child's learning.

Typescripts from these recorded interactions provided a rich source of data for the measurement of motivation techniques used by the mothers, their completeness and specificity in transmitting the basic information which the child had to learn, the kinds of feedback they sought from the child in order to judge his learning, and their ability to interpret the child's needs correctly and react to his behavior appropriately. At the same time the child's learning could be gauged from his task performance during the teaching session and from tests administered immediately afterwards. In addition, the behavior of the child could be evaluated for the presence of various undesirable behaviors interfering with learning or with the development of optimal attitudes toward the learning situation.

In the two cognitive sorting tasks the mothers were asked to teach their children to sort objects in specific ways and to explain the sorting principles or reasons for the resultant groupings. The first was a *toy sorting task* involving trucks, spoons, and chairs, each represented in three colors (red, yellow, and green). The mother's task was to teach her child to divide the toys into three groups by each criterion, *kind* of toy and *color*, and to be able to verbalize the reasons for these groupings ("These are all chairs," "These are the same color," etc.).

The next task was a more difficult *block sorting task* in which the mothers had to teach the children how to sort blocks into four groups using two criteria simultaneously. The blocks differed according to four attributes: color (red, yellow, green, and blue), shape (rectangular or circular cross-section), height (tall or short), and mark (*X* or *0* painted on top of the block). The children were to learn to group together blocks which were the same height and were marked with the same mark and to explain the reasons for these groupings. This required the formation of four groups of blocks, each of which was internally consistent on the two criterion variables but not on the other two variables. The four groups were composed of tall blocks marked *X*, short blocks marked *X*, tall blocks marked *0*, and short blocks marked *0*, respectively.

The mother was taught each of the sorting tasks while the child was out of the room and then, after she had learned it, was instructed to teach the child to sort the blocks correctly and to verbalize the sorting principle. The mothers were oriented to the task with a method developed to avoid suggesting particular teaching methods or terminology. They were allowed to use whatever labels they verbalized spontaneously while being taught the task ("0," "circle," "zero," "goose-egg," etc.). Task teaching was continued to overlearning criteria to insure that the mother knew the task and was not likely to become confused later when teaching the child.

The difficulty levels of the tasks were such that appropriate and useful interaction could be obtained from the entire range of subjects. Although there were differences among the children in their degree of familiarity with the task materials and in their repertoire of labels for the attributes involved, the tasks themselves--sorting into groups and explaining the sorting principles--were unfamiliar to all subjects.

The task facing each mother was the same: to teach the child to sort the toys appropriately and to explain the reasons behind the sorting. However, each mother entered the situation with her own unique background and approach to the task and with a particular history of interaction with her own child. The instructions given to the mother served only to set her goal--to tell her what she was to achieve. The means of achieving that goal, the way in which she taught the task to the child, was left entirely up to her.

The mother's ability to communicate specific meanings was crucial in these two tasks, since the child knew nothing about them and had to depend entirely upon the messages he received from her. This placed a considerable burden on the mothers since their task was clearly defined but the way in which they were supposed to go about it was not, and since they could expect little help from their children, at least in the beginning. It was clearly up to the mother to engage the child's interest in the task and to impart the information that he needed to know in order for him to participate more actively. Because the child could not participate actively and intelligently until he had acquired a certain amount of task-relevant information from the mother, the mother's communication skills were of crucial importance in these cognitive sorting tasks.

Many mothers' teaching was poorly organized or incomplete during this crucial period of introduction of basic information, so that their children participated only in a passive way or else began to resist the task early. In these dyads the interaction was for the most part one-way--from mother to child. The mother kept attempting to get desired responses from the child but met with little or no success. Other mothers who were able to transmit the necessary basic information to their children early in the task usually settled into a more balanced or complementary interaction in which the child participated more actively, asked questions, made relevant comments, and generally showed evidence of self-motivation.

On the third interaction task, the child could learn to participate actively much more quickly, so that the affective and control aspects of communication assumed a relatively greater importance with respect to the information-transmission aspects. On this task the mother and child cooperated in copying geometric designs with an "Etch-a-Sketch," a commercially available toy. The Etch-a-Sketch consists of a five-by-seven inch screen situated above two knobs which are used to make lines on the screen. One of the knobs controls vertical movement of the line on the screen (turn clockwise to make the line go down, counter-clockwise to make the line go up), and the other knob controls the horizontal movement of the line (turn clockwise to go to the right, counter-clockwise to go to the left). During the interaction session the mother and child had to take turns making successive individual line segments of the designs, each using only the knob assigned. In order to copy the designs properly, the mother had to instruct the child to move the knob in the correct direction (clockwise or counter-clockwise) on each turn, and to stop when the proper line length was reached. She was allowed to direct her child as specifically as she wished as long as she did not actually make his line for him. The task, therefore, placed a premium on fore-planning and precision of movement so that the mother was forced to exercise continued tight control over her child.

The mother was allowed to attempt each design as many times as she desired, stopping when she and her child produced a copy which "satisfied" her. Thus, all three tasks forced the mother to assume responsibility for setting the standards of excellence which she imposed upon herself and her child. In the two cognitive sorting tasks, it was she who was to decide when to stop teaching, and in the Etch-a-Sketch task, it was she who was to decide when to accept a given design and go on to the next one.

The Etch-a-Sketch task contained an additional element which served to increase the pressure upon the mother to maintain constant control over her child. In contrast to the sorting tasks, the responses of the child on the Etch-a-Sketch task were irreparable; that is, once a line was made, there was no way to erase it. If the child started off in the wrong direction or continued making his line too far, a short projection or "tail" would extend from a corner of the figure so that the copy did not match the design model. Once such a mistake was made, there was no way to erase or eliminate the unwanted projection; the mother had to either continue with an imperfect figure or get a new board and start all over again on the same figure. Thus, although the information to be transmitted to the child was relatively limited and the responses required of him were relatively simple, at least in the abstract, the heavy premium placed on accuracy and care made the task much more difficult than it may have first appeared.

Each of the three tasks yielded a score by which the subjects' performance could be scaled. For the two cognitive sorting tasks, scores were based on the results of tests given the child after the mother finished her teaching program. Each test required the child to repeat the task, except that now the mother could not help him. For the toy sorting task, he was asked to sort the toys in the two ways that his mother had shown him and to explain the reasons for sorting the toys as he did. For the block sorting task, the test was conducted by giving the child two new blocks that he had not previously seen and asking him to place the blocks in the correct groups and to explain the reasons for grouping them. For both tests the scores range from zero (failure to place either block correctly or to sort by either sort correctly) to six (both sorts correctly done and fully explained).

On the Etch-a-Sketch task, the subjects' productions were traced and later scored. Scoring was accomplished by measuring discrepancies between the traced productions and the original models, deducting points both for extraneous line projections (tails) and for deviations in line length which exceeded predetermined specifications (see Appendix G for full description of scoring procedure). The maximum score was fifty points, equal to the total number of lines in the five figures combined. The subjects' scores for their best attempts at each design (the one that yielded the highest score) were summed to attain a single score--the "best possible" score.

To preserve the interaction data for detailed analysis, the verbalizations of each mother and child were tape recorded and their nonverbal behavior was recorded by an observer watching through a one-way window. The two tape recordings (subjects' verbalizations and observer's description) were then transcribed and used in combination to form a single data bank for analysis. The data to be discussed were derived by applying rating scales and coding category systems to the typescripts from these interactions. Typescripts were identified by code number so that raters knew only the sex of the child. The names, social class membership, intelligence test scores, and other pertinent data on the subjects were unknown to them. By appropriately coordinating the two transcripts, raters could reconstruct the interaction, placing each verbalization in context with the nonverbal behavior. The observer's descriptions included essentially all attempts to communicate through expression or gesture and all contact between mother and child as well as all contact with the task materials. This method of data collection was cumbersome and expensive, but it had the advantage of yielding a permanent body of raw data which could be subjected to an exhaustive coding analysis.

The analysis of mother-child interaction presented below is based on data from the block sorting task and the Etch-a-Sketch task. The toy sorting task was not analyzed because it is structurally similar to the block sorting task but somewhat less useful as an instrument for eliciting a wide range of maternal teaching behavior. It served important functions, however, in acclimating the subjects to cognitive sorting tasks and in allowing the mothers to establish a routine in their approach to teaching. It was the first interaction task completed by each pair of subjects and was immediately followed by the block sorting task. The Etch-a-Sketch task was administered later in the session. (See Appendices G, H, and I for complete instructions for each task and for the scoring and coding systems used.)

The block sorting task was analyzed exhaustively by a variety of coding and rating categories. One coding system involved analyzing the task by individual message units (essentially clauses) and obtaining the frequencies of each type of message utilized. Maternal message categories included informing, motivating, controlling, requesting feedback, affirmative response to correct responses of the child, and negative responses to errors by the child. Child categories included passive listening, correct and incorrect verbal responses and block placements, and several categories reflecting disinterest or resistance to the task. This coding system provided measures of the relative frequencies of these various categories in each interaction session. A second coding system focused on the task-specific message units, with particular reference to their content specificity and to their sequencing with respect to one another and to the actions of the child. The *children were also coded for presence or absence of certain behaviors* which are associated with failure to properly learn the task. In addition to the coding analyses, global ratings of maternal warmth and monitoring behavior and of child cooperation were also made. Many of the same variables also were assessed in the Etch-a-Sketch task, although an exhaustive coding analysis was not necessary because of the more simple and repetitive nature of the task responses in that interaction.

Analysis of Mother-Child Interaction: Selection of Variables

In considering the communication aspects of the teaching interactions, it is useful to explore the analogy between the mother's task in teaching the child to sort blocks and the task of a programmer who is attempting to instruct a machine to sort a deck of punched cards into several sub-decks. Both the similarities and the differences involved are instructive and help form a framework for understanding the mother-child communication system.

The programmer's job may be generally described in the following manner. He must first read information to the machine. That is, he must tell the machine which columns on the card to attend to and retain as basic information. In this respect, the cards and the blocks are analogous in that both are units or entities which have many different attributes, only some of which are relevant to the task at hand. In the reading-in process, the programmer tells the machine, as the mother must tell the child, which attributes are to be attended to. Once the information is read in, the programmer must instruct the machine to the fundamental differences between the child and the machine which make human communication so much more complex. As long as the programmer restricts his communication to symbols acceptable to the machine, the response of the machine will be completely predictable and controllable. The information and operations available to the machine are known to the programmer and controlled by him, and they will remain in the machine as long as the programmer desires. This is not necessarily true of a mother's teaching messages, even when they are completely unambiguous, specific, and efficient, because the mother-child system is much more open and the child is not restricted to one or a few known responses to a given message. Instead of merely receiving the message as intended, the child may pretend to understand it when he does not, fail to receive it altogether for lack of attention, receive only a portion of it or a distortion into a related but nevertheless different message, react to it with a chain of responses leading farther and farther away from the task at hand, or produce some other unintended and possibly undesirable response.

Even though the child's capacity for perception, symbolization, and memory is infinitely greater than that of any machine, the dynamic factors in human communication (competing internal and external stimuli, motivational states, and other subjective states which affect perception and registration of stimuli) make the mother's task much more complicated than that of the programmer, even for the transmission of a simple message. The mother cannot merely assume that her message has been properly received, even though she may have encoded it with proper symbols and specificity. If she wishes to be sure that the child has understood her, she must get feedback from him; she must ask him to repeat the message back to her or to produce the responses that will allow her to determine whether or not he received the message.

The latter type of feedback request corresponds to the programmer's request for operations upon the data. Here again specificity is a key factor, since even though the data may be properly read in, both the child and the machine may fail to perform the desired operation if the instructions are not unambiguously clear. When the desired result is not obtained, the difficulty in the program must be sought out and corrected. This is usually a much more difficult and complex task for the mother than for the programmer, since the programmer knows exactly what data and instructions are in the machine. The mother does not have this advantage, partly because the input perceived and retained by the child may not be congruent with that intended by the mother, and partly because the mother must depend upon her own memory to review her program (and here dynamic factors in the mother become an additional complicating factor).

The net result of all these factors is that interpersonal communication is much more complex and much less predictable than the communication between programmer and machine. When things go well and there is no interference, an equivalent message can be communicated much more quickly and efficiently from mother to child than from programmer to machine. When breakdowns occur in human communication, however, isolation of the causal factors can be a long, slow process which may lead to the emergence of many unintended messages and meanings. Sometimes these may be neutral or even desirable, such as when the child learns more than he might have otherwise.

sort the cards according to the desired scheme. In the machine, this would ordinarily be a two-step process in which the machine would be instructed first to select according to one column representing a variable and then to sub-sort the two groups into four groups, using the second column as the basis for separation. Since the machine is highly predictable and circumscribed in its operations, the situation approaches a closed system as opposed to the highly open and unpredictable system of mother-child communication. Nevertheless, communication difficulties can and do occur. During the read-in process the programmer may use a symbol (analogous to maternal language) which the machine is not equipped to receive or understand. If this occurs, the information will not be properly read in and the programmer must change his program to fit into a symbol system which the machine is equipped to receive. The analogous situation occurs in mother-child interaction when the mother uses a word or phrase which the child does not understand.

A similar difficulty can occur in the operations aspect of the program, which must be written in such a way that the machine is instructed to do only those things which it is designed to do. Should the programmer request operations the machine is not equipped to do, the machine will be unable to act.

Even if the programmer avoids using symbols or calling for operations that the machine is not equipped to handle, he may still fail to achieve his desired purpose if his program is not specific enough. Specificity must be such that the machine will carry out only the desired program, adding or subtracting nothing. Errors may occur for such reasons as failure to specify how many cards are to be read, failure to specify screening codes if some cards are not to be included in the operation, and failure to give each different variable a unique label. The function of specificity here is to close the system completely. When the information to be read into the machine is precisely circumscribed and coded with mutually exclusive unique labels, and when each successive program operation is unambiguously charted, the machine is prepared to carry out the desired operation.

Insofar as the capacity of the child to receive communication parallels that of the machine, the mother's teaching task parallels that of the programmer. In order to successfully teach a cognitive sorting task, she must first "read in" the necessary basic information. In the case of the block sorting task it is the relevant attributes of the block--the height (tall or short) and the marks (X or O). Like the machine, the child will not properly process the data unless the mother uses terms that the child can understand and presents the information in such specific language that her message is unambiguous. Unlike the machine, however, the child will not necessarily give notice if he fails to understand the mother's message. He may even nod his head and give other cues suggesting that he has understood when in fact he has not. In addition, even in cases where the message is specifically and properly coded and is understood in its intended meaning, with the passage of time the message may be distorted or altogether deleted through the processes of retroactive inhibition or simple forgetting.

These two potential difficulties in mother-child communication (undetected failure of registration and memory failure) are facets of

Often, however, the effects of communications breakdowns are undesirable. The most obvious one is communication failure: the child does not learn the intended message. However, since human beings are dynamic organisms in which events occurring in one sub-system can affect events occurring in others, inadequacies in maternal communication may have more far-reaching effects. Prolonged difficulty in communication is likely to lead to frustration of both the mother and the child and, if the child is asked to respond, is likely to increase the rate of failures. This in turn can lead to the emergence of inhibition and resistance in the immediate situation and, by generalization, to the development of maladaptive attitudes and values toward learning in general.

The above discussion takes into account only those maternal behaviors that parallel the actions of a programmer dealing with a machine (i.e., information transmission). Other factors exist in mother-child interaction which further increase the complexity and heighten the potential for varied outcomes. These reside in the fact that the mother and child have shared a common history of dynamic interaction and have built up a set of habits and expectations regarding each other. Consequently, mother-child interaction involves more than simple information transmission. The mother will have to engage and sustain the child's motivation for the task, and she may react to his task responses with reinforcing affirmation and negation. These maternal activities have some information transmission functions, but they also have important affective elements and introduce the dimensions of love-hostility and autonomy-control.

The effect of these variables, which do not exist in the programmer's situation, is to vastly multiply the range of possible outcomes. A programmer might become highly ego-involved and emotionally aroused when trying to get a machine to accept and run his program, but none of these emotional behaviors will in any way affect the machine. The structure built into that system requires that he respond to the machine with information and corrective feedback. There is nothing he can do to change the machine; he can only change his own behavior to conform to the needs of the machine. The mother has this same option open to her, but in addition she may attempt to change the child. Sometimes this may facilitate communication and lead to quicker or more complete learning. At other times, however, it may lead to the emergence of undesired and maladaptive responses in the child, sometimes proceeding to the point where communication of the intended message becomes difficult or even impossible.

The preceding ideas on interpersonal communication were applied to the mother-child interaction situations as guides to the selection of variables for investigation. For the mothers, attention was concentrated on transmission of task-specific information, affective responses to the children, and techniques used to elicit or compel the cooperation of the children. Data on the children included measures of learning, both task-specific performances within the teaching part of the interaction and post-task test scores, measures of attention and cooperation, and measures of response process indicating the presence of undesirable coping strategies. The data to be discussed are derived primarily from the analysis of the block sorting task, although some measures from the Etch-a-Sketch task are also included.

Some global ratings were used, but most of the measures are percentage scores reflecting the frequency of occurrence of specific behavior units. Many of the variables are factor scores which combine several interrelated frequency measures. Many of the maternal measures are addressed to the same general variable (specificity of teaching), but apply only to maternal behavior in specific sub-parts of the task (orientation, pre-response instructions, feedback following correct placements, feedback following errors, etc.). These distinctions were made because differences among the children in cooperation and learning success meant that each mother faced a different and unique set of specific situations when teaching, even though all had the same general task to teach. Separate measurement of sub-parts allows comparability of mothers who are facing the same teaching situation (such as correcting errors), even though one mother may face the particular situation many more times than another. In this manner, differences among the children in cooperation and learning success are neutralized, and the maternal measures reflect the mother's average quality of performance in specific sub-parts of her task rather than the relative amount of time spent in that sub-part.

Measures of Maternal Teaching Specificity

The information-transmission aspects of maternal teaching were evaluated for specificity (clarity and precision in specifying the intended meaning). Specificity is construed as a continuous variable, having both verbal and nonverbal aspects, which is present in all communication. In our mother-child interaction situations, it may be viewed as a statement of probability reflecting the likelihood that the child will perceive the meaning intended by his mother in a given communication (or, if maternal intent is ignored, the likelihood that the child will comprehend the full implications of the message and be able to apply them to the task at hand). Different degrees of specificity in both verbal and nonverbal aspects are shown in the following series of examples, all of which are possible maternal responses to a mistake in block placement by the child:

1. "That's not right."
2. "What about the mark?"
3. "No, those are 0 and that's an X."
4. (Mother retrieves block and points to mark:) "No, this has an 0 . . . see? You have to find some more with 0."
5. (Mother points back and forth between the erroneously placed block and the other blocks in the group:) "No, see . . . this one is an 0 and those have X."
6. (Mother points back and forth between the erroneously placed block and the other blocks in the group:) "No, see, this has 0 and these have X. We don't want to mix up the 0's and the X's, so you'll have to put this block where there are some other blocks that have 0 on them, too."

The above examples are hierarchically arranged in order of increasing specificity. In the verbal sphere, they range from failure to mention the relevant attributes to verbalization of the general category (mark), to verbalization of the mark specific to the block in question (Q), to an explicit statement connecting the specifically verbalized mark to the sorting principle. Paralleling this increasing verbal specificity is a progression of nonverbal behaviors. These range from failure to supplement the verbal message with any nonverbal accompaniment, to pointing back and forth between adjacent blocks in order to visually emphasize the contrast in marks.

These two aspects of specificity may be conveniently described as "labeling" and "focusing." Labeling refers to the mother's supplying a verbal referent for the relevant attributes of the block, and focusing refers to supplemental nonverbal actions which attempt to focus the child's attention on the relative attributes by making them more salient in his perceptual field. The variables below reflect the degree of specificity with which the mothers communicated task information.

Orientation

The period of task orientation was considered to extend from the beginning of the task until the mother first requested the child to place blocks by height and mark. The orientation period corresponds to the reading-in phase of a programmer's job, in which the machine is provided with the necessary basic information it requires before it can do the desired operations. Since the mother's first placement request corresponds to the programmer's request for operations, this event was designated as the end of the orientation period. In many cases this occurred before the mother had introduced the attributes of height and mark or the idea of sorting into exclusive groups, so that she was referring to data and calling for operations which had not yet been "programmed."

Maternal teaching during the orientation period is represented by a factor score which combines six measures of the completeness and specificity of information given during that time. One of these measures was simply the time spent on orientation, representing the degree to which each mother emphasized this particular aspect of teaching. Other measures on the factor refer to the specificity with which the mother presented certain aspects of the task: her introduction of the two relevant attributes, height and mark (coded for both labeling and focusing), her introduction of the idea that the blocks were separately grouped (whether or not this fact was specifically verbalized), and her introduction of the sorting principle per se (whether or not she explicitly tied together the relevant attributes of the blocks and the act of placing them in their separate groups, as in example 6 above).

The final orientation measure concerns the mother's use of specific labels in outlining the general nature of the task ("Put the blocks together so that the blocks in each group are the same height and have the same mark" vs. "put the blocks together the way they go"). One extreme on this factor is represented by the mother whose first action was to hand the child a block and say, "Put this where it goes." This mother gave no orientation whatsoever, beginning the task with an immediate request for block placement by the child. At the opposite pole are mothers who spent a considerable time orienting the child, introducing the relevant attributes of height and mark with specific labels and with focusing behavior, and specifically articulating the relationship between these attributes and the sorting principle.

Requesting Block Placement

After the initial orientation period, much of the interaction was typically spent in asking the child to make responses and then giving feedback. Some of his responses were physical (placement of blocks) and some verbal (naming of the attributes on the blocks and verbalization of the sorting principle). The measure used for the mother's frequency of requesting block placement is a percentage score relating the number of block placement requests to the total number of message units.

Requesting Labels

This percentage score complements the previous one and reflects the mother's relative use of requests for verbalization of labels by the child (either in labeling individual blocks or in explaining the sorting principle). Although it was important that the child be able to both place and label the blocks correctly, the verbal responses were more crucial because they carried much more specific information. Correct block placement was not necessarily indicative of knowledge of the sorting principles, since the child could often place blocks correctly on a pure chance basis or according to some idiosyncratic sorting principle of his own. In order to be sure that the child was in fact attending to the relevant attributes and using them as the basis for his sorting responses, a mother had to seek verbal feedback by asking the child to produce the labels and the sorting principle. Thus, not only was it important for the mother to be specific in transmitting information to her child, but it also was necessary for her to get specific feedback from him.

Specificity of Instructions to the Child

The specificity of the mother's instructions (requests for feedback) is represented by a factor score which combines measures from the block sorting and Etch-a-Sketch tasks. The various measures reflect the degree to which the mother used relevant verbal labels and focusing attempts in her instructions to the child. For both tasks the word "instructions" refers to directions given to the children *prior* to each response which describe the response the mother expects (as opposed to "feedback" which occurs *following* a response and in reaction to it). As a result, this factor refers to pre-response specificity in contrast to the feedback factor (to be described below) which refers to post-response specificity.

In the block sorting task, specificity was coded if the mother described the block to be placed ("That's a tall block with an *X* on it. Where does it go?") or the target group which the child was to seek ("Now where is the group that is tall and has *X*?"). Specificity was considered absent when the mother did not provide the specific labels ("Now where does this one go?"). Once the child acted on the instruction by committing himself to a group, right or wrong, the pre-response period was considered ended and any subsequent discussion was scored as feedback.

In the Etch-a-Sketch task, specificity was coded if the mother made some attempt to tell the child which way to turn his knob or in which direction the line should go ("Now go up;" "Turn toward Mommy;" "Go like this" [demonstrating with hand motions]; "Turn the same way you did last time"). Specificity was considered absent if the mother merely indicated that the child should turn his knob without attempting to tell him which way to turn ("Now you turn").

It is assumed that each mother's goal at the above comparable instances was the same; that is, that the child should place the block in the correct group or that he should turn the knob in the proper direction. This factor score expresses the degree to which the mother articulated this goal in her pre-response instructions to the child rather than assume that the child understood her intention.

Specificity of Feedback

This factor score combines four measures of maternal feedback following placement responses on the block sorting task. Specificity (verbalization of labels and focusing attempts) was coded if the mother referred to the relevant attributes of the block when correcting errors or reviewing the sorting principle after correct responses. When corrective feedback was specific, the reason for the error was described ("No, they all have X, but this one is too big; you have to put it with the big X's"). Non-specific feedback did not contain this information ("No, it goes here"). Specificity was coded after correct responses if the mother reviewed the sorting principle or elicited it by questioning the child about his reasons for sorting. Specificity was considered absent if the mother merely responded with "That's right" or if she immediately went on to a new response. The factor score expresses the degree to which the mother referred to the relevant attributes of the blocks in her post-response feedback.

General Verbal Specificity

Each mother's general verbal specificity for the task as a whole is reflected in her specificity index. This index represents the percentage of task-specific statements which contain verbal labels referring to the height or mark of the blocks. The index is described as a measure of verbal specificity, since focusing behaviors are not included.

Measures of Maternal Affect and Control

The variables described above are concerned primarily with the information-transmission aspects of the interaction, although aspects of affection and control may be involved. In contrast, these latter variables are more prominent in the following maternal measures, although the behavior that they describe may sometimes involve transmission of task-specific information.

Affirmation/Negation Balance

This variable involves both information-transmission and affective components, although its pattern of intercorrelation with other variables suggests that the affective aspects are primary. The variable reflects the mother's immediate reactions to the task responses of her child. When a child placed a block correctly or produced the proper label to describe a block, mothers would frequently make an initial confirmatory response such as "Yes" or "That's right," and then expand upon the discussion of that particular block or go on to a new block. Similarly, mothers would often react to incorrect responses by saying "No" or "That's not right," and then commence to correct the child or give him a new command. However, many of the children's responses were not followed by these immediate reactions of affirmation or negation. In these situations, the mothers would present new information, ask the child a question, or give a command to go on to a new block. Nevertheless, the child ordinarily knew that his response had been correct or incorrect. Because of their immediacy, however, affirmation and negation responses are presumed to have a reinforcing effect and to act as social rewards or punishments to the child.

The affirmation/negation index expresses the balance between affirmation and negation in each mother's immediate reactions, weighted by her opportunities for each type of response. It is a ratio score obtained by dividing the rate of affirmation (the number of affirmations following correct responses divided by the total number of correct responses) by the total of the rate of affirmation plus the rate of negation (the number of negations following incorrect responses divided by the total number of incorrect responses). Consequently, an index of .50 would mean that a mother was equally likely to respond with affirmation to a correct response as she was to respond with negation when her child made an error. Values above .50 indicate a preference for affirmation over negation, while values below .50 indicate the opposite preference.

Praise and Engagement

Included on this factor are measures of attempts to engage the child's interest and cooperation through expressed or implied rewards (achievement satisfaction, mother's high positive regard, treats, or pleasure derived from the task itself), as well as the mother's actual use of reward in the form of praise. Maternal reactions defined as "praise" were of greater intensity than the reactions previously described as affirmation responses. They contained gestural or expressive components which signified pleasure at the child's achievements or warm feelings of regard toward him in addition to the simple verbal affirmation of the correctness of the response. At times they were more extended verbal statements of praise ("My, but you're a smart boy today").

The measures subsumed by this factor reflect the mother's tendency or preference in using praise and engagement techniques rather than her simple frequency in doing so. Consequently, a mother whose child made very many correct responses would not necessarily receive higher scores on the praise measures than a mother whose child made very few correct responses. Similarly, a mother with an interested, cooperative child is not penalized for her relatively infrequent engagement behaviors. The factor is primarily an expression of the mother's use of praise and engagement relative to the opportunity to do so, rather than merely a frequency-of-use measure.

Coercive Control

This factor subsumes measures of the mother's tendency to attempt to regulate the child's behavior through criticizing him personally or through making commands and directives which imply punishments for non-compliance. The factor is complementary to the previous one, in that both may apply to the same situations but represent contrasting maternal methods of coping with them. Behavior considered to be "criticism" was more intense than simple verbal negation, paralleling the relationship between praise and verbal affirmation described above. Maternal reactions were considered to be criticism if verbal negation was accompanied by gestures or expressions conveying hostility or displeasure, or if derogatory feelings about the child were expressed verbally ("You could learn this if you wanted to; you're just too stubborn").

Quality of Attention Demanded

The three measures previously described express the mother's relative use of different techniques presumed to affect the child's motivation. This variable and the one to follow reflect the mother's actual success in obtaining compliance, regardless of the particular methods she used. The behavior of each mother during periods of the interaction in which she was presenting information or explaining something to the child was studied for evidence of inattention by the child and for maternal reaction to this problem.

Each mother was rated on a six-point scale representing increasing degrees of demand for attention. Mothers rated as high in their demands for attention were vigilant in observing evidence of inattention in their child and were prompt to react to it. Mothers who allowed momentary lapses of attention but would intervene when their child became clearly absorbed in some non-task interest were rated at moderate levels of demand. Mothers rated low in attention-demand either made no attempt to intervene when the child's attention strayed from the task at hand or else were unable to establish sufficient control over the child to eliminate this problem.

Quality of Response Demanded

This variable complements the previous one by measuring the performance demands made upon the child at times when he was attempting to place blocks or to supply verbal labels in response to the mother's instructions. Mothers rated low on this variable allowed their children to place blocks in what appeared to be random fashion and/or to repeatedly give verbal responses which appeared to be egocentric "emissions" or blind guesses rather than serious attempts to formulate a response based on inspection of the blocks. Mothers rated high on this variable were alert in observing and correcting the emergence of this kind of behavior in their children. These mothers demanded that the child inspect the blocks before responding and would not allow carelessness or guesswork. In about 12% of our cases this rating was not made because the children involved always inspected the blocks before responding and consequently never presented the mother with the problem. All other mothers were rated on a four-point scale of increasing demand for deliberation and attention to the relevant block attributes by the child when responding.

Affectionateness

The final maternal interaction variable to be discussed is a factor score which combines eight ratings of each mother's affective response toward her child. Four of the ratings are based on her behavior in the block sorting task, and the other four are based on the Etch-a-Sketch task. Three of the ratings from each task are the mother's high point, low point, and most typical level on the Affectionateness Scale of the Fels Parent Behavior Ratings Scales (Baldwin, Kalhorn, and Breese, 1949). The scale is applied to the mother's overt behavior in the two interactions, to characterize her affective response to the child from warm and loving through neutral and unresponsive to hostile and rejecting. The fourth rating for each task characterizes the mother's underlying attitude toward her child (inferred from her overt behavior) on a scale ranging from high positive regard through neutral to rejecting. The two scales differ somewhat in the maternal variable to which they are addressed (overt affective behavior vs. inferred underlying attitude), but the ratings are highly intercorrelated and form a single factor.

The affectionateness scores correlate with the previously described factors of praise and engagement (positively) and coercive control (negatively). Those factors, however, primarily reflect the mother's verbal statements to the child made in connection with his cooperation or learning success on the task. The affectionateness factor is a more general assessment of the mother's affective interaction with her child, and it is heavily weighted with gestural and expressive components.

Interrelationships Among the Maternal Interaction Variables

Intercorrelations among the twelve maternal variables are presented in Table V-1. Inspection of the table reveals a pattern of relationships consistent with what would be expected from previous knowledge of the variables involved. Correlations among related variables were usually significant but not so high as to obscure the individuality of the separate measures.[1] The four measures of maternal specificity in teaching correlated positively with one another, and their pattern of relationships with the feedback-seeking variables suggests that the degree

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[1] Intercorrelation among the various factor scores occurs because the factors are unrotated rather than rotated. The factor scores used represent the first unrotated factor extracted from a matrix including measures selected on the basis of the results of earlier principal components factor analyses of a matrix containing all of the measures of maternal interaction behavior. Factor scores were obtained by entering only the variables which had high loadings in the rotated factor into a new analysis and then extracting the first unrotated factor. Since this procedure does not force orthogonality, intercorrelation among factors can and does occur (see Appendix J for complete list of variables and extended discussion of procedures).

TABLE V-1

Intercorrelations Among Maternal Interaction Variables*

	Requesting Block Placement	Requesting Labels	Specific Instructions	Specific Feedback	General Verbal Specificity	Affirmation/ Negation	Praise and Engagement	Coercive Control	Attention Demand	Response Quality Demand	Affection-ateness
Orientation	-.27	.07	.26	.31	.21	.10	.25	-.09	.11	.11	.21
Requesting Block Placement		-.29	-.08	-.33	-.13	-.29	-.31	.11	-.02	-.02	-.24
Requesting Labels			.05	.28	.07	-.03	-.09	-.19	.17	.15	-.03
Specific Instructions				.27	.40	.09	.33	-.06	.02	.01	.17
Specific Feedback					.29	.15	.23	-.18	.24	.18	.15
General Verbal Specificity						.09	.06	-.04	.01	.02	.02
Affirmation/ Negation							.30	-.06	-.01	-.05	.15
Praise and Engagement								-.20	-.01	.02	.59
Coercive Control									-.15	-.26	-.46
Attention Demand										.64	-.05
Response Quality Demand											.01

* $p < .05$ when $\underline{r} \geq \pm .16$
$p < .01$ when $\underline{r} \geq \pm .21$

of specificity with which the mothers presented information was related to their success in obtaining specific feedback from the children. A similar situation exists among the affect and control variables, where measures of maternal affectionateness and use of praise and engagement correlated positively with each other and negatively with maternal use of coercive control. Across the matrix as a whole there was a general tendency for specificity in teaching to be correlated positively with maternal affectionateness and praise and engagement. The two ratings of maternal attempts to regulate attention and response quality were less consistently and strongly related to the other variables, but were highly correlated with each other. The general pattern of correlation suggests that these ratings were positively related to specificity of teaching and negatively related to coercive control but unrelated to affectionateness and praise and engagement.

Relationship of Maternal Interaction Measures to Intelligence and Performance Scores

Correlations of the maternal variables with the mother's WAIS Verbal IQ and interaction task scores are presented in Table V-2. The relationships between maternal teaching variables and mother's verbal IQ parallel the relationships among the teaching variables themselves as seen in Table V-1. Verbal intelligence was positively associated with teaching specificity and with praise and engagement, and negatively associated with coercive control.

Correlations of maternal variables with interaction task performance were always consistent in direction, but they varied considerably in size. All twelve maternal variables correlated significantly with the child's score on the post-task test following the block sorting task. Coefficients involving the toys and Etch-a-Sketch scores were usually lower than those involving the block sorting task. This is, of course, primarily due to the fact that most of the maternal data are from the block sorting task and consequently are more directly related to the child's performance on it. Fluctuations in the size of correlation coefficients were also related to differences in the tasks themselves. For example, on the Etch-a-Sketch task, errors in direction or line length could not be corrected, so that specificity in pre-response instructions was relatively more important, and specificity in post-response feedback relatively less important than in the two cognitive sorting tasks. Many additional comments concerning the interrelationships among the maternal teaching variables and their relevance to the performance scores could be made on the basis of data contained in Tables V-1 and V-2. However, further discussion of maternal variables is postponed until data on the children's interaction behavior are introduced.

Measures of Child Behavior in the Interaction Situations

As was the case with the mother data, the data on the children include both factors combining several related measures and single ratings of specific variables. In the child data, the factors are general

TABLE V-2

Correlations of Maternal Interaction Variables with Maternal Intelligence Scores and Performance Scores on the Three Interaction Tasks*

	WAIS Verbal IQ	Toys Sorting Task Score	Block Sorting Task Score	Etch-a-Sketch Score
Orientation	.36	.26	.37	.22
Requesting Block Placement	-.32	-.19	-.40	-.08
Requesting Labels	.13	.08	.32	.11
Specific Instructions	.57	.08	.32	.44
Specific Feedback	.34	.29	.37	.15
General Verbal Specificity	.18	.07	.19	.13
Affirmation/ Negation	.14	.10	.19	.10
Praise and Engagement	.46	.22	.29	.15
Coercive Control	-.18	-.22	-.23	-.14
Attention Demand	.10	.24	.25	.16
Response Quality Demand	.11	.24	.27	.21
Affection-ateness	.31	.24	.27	.14

* $p < .05$ when $\underline{r} \geq \pm.16$
$p < .01$ when $\underline{r} \geq \pm.21$

measures based on the child's behavior during the task as a whole, while the ratings are addressed specifically to his behavior during periods when he was attempting to place blocks, and reflect the presence of certain undesirable or maladaptive response variables. The following variables are based on the children's behavior during the interaction.

Resistance

This factor combines several measures of non-cooperation and resistance toward the mother and/or the task. Children high on the factor attempted to leave the task, persistently complained about having to do the task and tried to avoid it, or continually refused to cooperate with the mother and do what she asked. There was extreme variability on this factor, with some children remaining docile, attentive, and compliant throughout the task and others maintaining resistance of such intensity that the mothers were unable to impose sufficient control for meaningful teaching. The resistance factor subsumes four measures from the block sorting task and one from the Etch-a-Sketch task. All subsequent child data are derived solely from the block sorting task.

Errors

This factor subsumes four measures relating to the frequency of errors in the child's responses during the block sorting task. Although verbal errors are involved to some degree, the factor primarily reflects the frequency of placement errors by the child. Children low on this factor learned the task relatively efficiently, making few errors. Children high on the factor had a large number of errors, particularly in placement responses. Many of the latter children were careless or impulsive in responding so that many of their placements were random guesses rather than responses resulting from processing the characteristics of the blocks (see "Non-meaningful Placement" as described below).

Labels

This factor subsumes four measures of the child's verbal activity during the block sorting task, in particular his ability to produce and verbalize appropriate labels for the height and mark of the block. Children high on the factor produced many such labels. Children low on the factor did not, either because their mother asked them very infrequently to discuss the attributes of the blocks, or because the children were relatively unsuccessful at learning the labels and unable to produce them upon demand.

Verbal Participation

This factor includes several measures related to the verbal participation of the child (total words, words per minute, etc.). Children high on the factor had a relatively high percentage of verbal units. Children low on the factor had a relatively large number of units which included only nonverbal activity, such as passively listening to the mother or placing blocks without verbally discussing them.

Since the child's verbal statements may have been relevant or irrelevant to the task, and since task-relevant statements may have been either correct or incorrect, children high on the verbal participation factor were not necessarily more cooperative in learning the task or more successful in producing labels.

Inhibition in Responding

Each child was coded for presence or absence of inhibition in his placement responses. Inhibition was considered to be present if the child cried or pleaded for help from the mother in an attempt to avoid committing himself to placement responses, or if he tried to delay or avoid commitment by making repeated false starts or hovering over groups without releasing the block. The crucial aspect of response inhibition, regardless of the particular form of expression used, was evidence that the child was attempting to delay or avoid commitment to a group.

Spuriously Successful Placement

This variable, also scored as present or absent for each child, describes a reaction in which the child repeatedly placed blocks correctly but gave no other evidence that he knew or was using the sorting principle as defined. The variable was coded only for cases which contained at least one perfect unit--a series of placements in which at least one of each of the four types of blocks was placed correctly.

Children coded for spuriously successful placement usually placed the blocks quickly and with apparent assurance but without any overt looking or searching behavior to suggest that they were attending to height and mark. When asked to explain their placements they tended to become uncomfortable and unable to respond. Their success in placing blocks correctly was considered spurious in the sense that it was not accompanied or followed by any other indications that the child had mastered the principle as defined.

Non-meaningful Placement

This variable was coded if the child appeared to be placing blocks in groups without attempting to determine where they belonged and if there was no evidence of any pattern or sorting principle in his placements. In such instances the child appeared to be placing randomly or to be systematically going from group to group on the board until he eventually arrived at the correct place. In either case, the child's behavior contained no evidence to suggest that he was attending to the stimulus attributes of the blocks. This behavior occurred frequently enough to allow the use of a quantitative score rather than a simple presence-absence notation. Each child's score reflects a combination of the frequency and intensity with which this behavior appeared when he was placing blocks. This is one of the measures included on the "errors" factor described above, but it is also retained as a separate variable because of the specific information it conveys concerning the child's response to the task.

Interruptive Distraction

This variable, a frequency-intensity score similar to the previous one, reflects the degree to which the child was inattentive to the mother or slow to respond to her directions because of temporary involvement in non-task interests. Included are such activities as scanning the surroundings and listening for sounds having nothing to do with the task, attempting to play with the blocks or other objects in the room, and interrupting the mother to ask questions about non-task matters such as refreshments or play.

Behavior of this kind differs from that described above as "resistance" in that it does not involve overt expression of distaste for the task per se. Task resistance and interruptive distraction are similar, however, in that they reflect the child's attitude toward the task as a whole and refer primarily to his behavior before and in between responses. In contrast, the variables of inhibition, non-meaningful placement, and spuriously successful placement apply to the child's behavior during placement responses and represent problems in the response process itself.

Inhibition in the Test Period

Each child was coded for presence or absence of inhibition in the post-task test. The behavior considered to be evidence of inhibition was the same as that described above for inhibition in the teaching period, although in the test period the child was interacting with the tester rather than with his mother.

Non-meaningful Placement in the Test Period

The child's behavior in the test period was also scored for non-meaningful block placement, although in this context it had a more circumscribed meaning. It was scored as either present or absent, being considered present if the child maintained that the test blocks could go in any or all of the groups. Children for whom this behavior was coded, therefore, apparently had failed to learn that there was only one right group for each block. This variable was coded as absent for children who selected a specific group in which to place each test block, regardless of the correctness of their choice or the relevance of their explanation.

Interrelationships Among the Child Interaction Variables

Intercorrelations among the child variables are presented in Table V-3.[2] The coefficients are generally low except for the two cases where an individual behavior variable was also part of the factor (non-meaningful placement and the errors factor; spuriously successful placement and the labels factor). The relationships among the four factors and the various ratings of behavior problems correspond to what would be expected from the preceding discussion. That is, the resistance and errors factors were positively associated with behavior problems in the child, while the labels factor was negatively related

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[2] The four factor scores among the child variables in Table V-3 are unrotated factors obtained by the methods described earlier in the discussion of maternal variables. As in the case of the maternal factors, the methods used do not force orthogonality, and correlation between factors is possible (see Appendix J for expanded discussion).

TABLE V-3

Intercorrelations Among Child Interaction Variables*

	Errors	Labels	Verbal Partici-pation	Inhibi-tion	Spuriously Successful Placement	Non-meaningful Placement	Interrup-tive Dis-traction	Test Period Inhibition	Test Period Non-meaningful Placement
Resistance	.21	-.27	.08	-.06	.02	.24	.45	-.02	.20
Errors		-.22	-.09	.14	-.24	.76	.32	.17	.28
Labels			.14	-.18	-.59	-.19	-.11	-.10	-.32
Verbal Participation				.01	-.18	-.08	.10	-.08	-.08
Inhibition					.04	.01	-.09	.33	.18
Spuriously Successful Placement						-.19	-.13	.08	.11
Non-meaningful Placement							.24	.16	.33
Interruptive Distraction								-.03	.18
Test Period Inhibition									-.17

* $p < .05$ when $\underline{r} \geq \underline{+}.16$
$p < .01$ when $\underline{r} \geq \underline{+}.21$

to these problems. The verbal participation factor was unrelated to the other measures, reflecting the fact that sheer quantity of verbal output did not determine the quality of the child's responses in learning the task.

Relationships of Child Interaction Variables to Intelligence Test and Performance Scores

Correlation coefficients relating the child interaction variables to Stanford-Binet intelligence test performance and to the three interaction task scores are presented in Table V-4. The most prominent and consistent correlations in Table V-4 involve the errors and labels factors and the measure of non-meaningful block placement. The labels factor was positively associated with Binet IQ and task performance, while the errors factor and the non-meaningful placement score correlated negatively. The resistance factor also correlated negatively with the interaction task scores, but it is less closely related to the child's intelligence test performance. As was the case with the maternal data, the child variables tended to correlate higher with the block sorting task score than with the scores from the other two tasks, although many of the latter correlations were also significant.

The child behavior variables of resistance, inhibition, spuriously successful placement, and non-meaningful placement were actually more strongly related to the children's scores on the block sorting task than the coefficients in Table V-4 would suggest, because these variables tended to be unrelated or negatively correlated with one another and therefore represented separate groups among the total sample of children. When this problem was countered by combining sub-groups of children coded on the various behavior problems, or when the children not coded on any behavior problem (rather than with the remainder of the entire sample) the negative associations between behavior problems and performance scores rose dramatically.

Relationships Between Maternal Measures and Measures of Child Behavior

The preceding discussion has presented maternal variables and child variables as separate groups, examining relationships among the variables within each group and relating them to intelligence test and interaction task performance. It is now appropriate to consider the mother and child variables as a single body of data and to investigate the relationships among the measures. These data are presented in Tables V-5 and V-6, followed by a discussion of the causal mechanisms which appear to be involved.

Correlations between maternal and child variables are presented in Table V-5. As expected, child variables reflecting performance quality correlated highly with maternal teaching specificity measures, while child attention and cooperation measures correlated more closely with maternal control measures. The various interrelationships will be discussed in more detail after some additional data are presented in Table V-6.

TABLE V-4

Correlations of Child Interaction Variables with Child Intelligence Test and Interaction Task Performance*

	Stanford-Binet IQ	Toys Sorting Task Score	Block Sorting Task Score	Etch-a-Sketch Score
Resistance	-.10	-.28	-.30	-.21
Errors	-.30	-.28	-.36	-.22
Labels	.36	.28	.51	.26
Verbal Participation	.08	.08	.20	-.03
Inhibition	-.06	-.01	-.18	-.12
Spuriously Successful Placement	-.18	-.05	-.29	-.13
Non-meaningful Placement	-.38	-.30	-.34	-.28
Interruptive Distraction	-.10	-.07	-.11	.02
Test Period Inhibition	-.17	-.09	-.21	-.10
Test Period Non-meaningful Placement	-.31	-.20	-.44	-.07

* $p < .05$ when $r \geq \pm .16$
$p < .01$ when $r \geq \pm .21$

TABLE

Correlations of Maternal and

	Resistance	Errors	Labels	Verbal Participation	Inhibition
Orientation	-.10	-.23	.31	.10	-.06
Requesting Block Placement	-.01	.33	-.26	-.39	.21
Requesting Labels	-.23	-.15	.57	.21	-.08
Specific Instructions	-.06	-.14	.30	.09	-.08
Specific Feedback	-.20	-.28	.41	.09	-.06
General Verbal Specificity	-.01	-.29	.33	.09	-.14
Affirmation/ Negation	-.07	-.16	.10	.10	-.18
Praise and Engagement	-.05	-.18	.12	.10	-.12
Coercive Control	.40	.30	-.21	-.04	.13
Attention Demand	-.52	-.24	.17	-.06	.10
Response Quality Demand	-.48	-.34	.15	-.11	.15
Affectionateness	-.16	-.15	.13	.14	-.14

* p < .05 when r ≥ ±.16
p < .01 when r ≥ ±.21

V-5

Child Interaction Variables*

Spuriously Successful Placement	Non-meaningful Placement	Interruptive Distraction	Test Period Inhibition	Test Period Non-meaningful Placement
-.30	-.28	-.01	-.13	-.23
.08	.26	-.02	.26	.17
-.20	-.14	-.05	-.01	-.17
-.30	-.20	-.09	-.18	-.16
-.19	-.29	.11	-.22	-.22
-.17	-.18	.00	-.06	-.17
-.08	-.12	.12	-.03	-.26
-.08	-.23	.00	-.11	-.16
.03	.25	.22	.05	.14
.11	-.36	-.43	-.15	-.18
.13	-.37	-.37	-.07	-.25
-.08	-.11	-.04	-.04	-.04

TABLE V-6

Correlations of Individual Maternal and Child Interaction Variables
with Intelligence Test Data and Combination Scores
from the Block Sorting Task*

Interaction Variable	Intelligence Measures		Mother-Child Factor Scores		Child Behavior Combination Scores	
	WAIS IQ	Stanford-Binet IQ	Tug of War	Verbal Task Interaction	Teaching Period	Test Period
Orientation	.36	.37	-.17	.21	-.31	-.26
Requesting Block Placement	-.32	-.35	.02	-.73	.27	.32
Requesting Labels	.13	.10	-.21	.44	-.24	-.15
Specific Instructions	.57	.28	-.19	.08	-.31	-.26
Specific Feedback	.34	.26	-.24	.31	-.27	-.34
General Verbal Specificity	.18	.13	-.04	.11	-.32	-.19
Affirmation/ Negation	.14	.17	-.14	.24	-.19	-.25
Praise and Engagement	.46	.29	-.26	.22	-.23	-.22
Coercive Control	-.18	-.14	.51	-.12	.29	.16
Attention Demand	.10	.15	-.45	-.02	-.18	-.26
Response Quality Demand	.11	.20	-.48	-.03	-.14	-.26
Affectionateness	.31	.24	-.31	.18	-.22	-.06

* $p < .05$ when $r \geq \pm.16$
$p < .01$ when $r \geq \pm.21$

TABLE V-6* - continued

	WAIS IQ	Stanford-Binet IQ	Tug of War	Verbal Task Interaction	Teaching Period	Test Period
Resistance	-.07	-.10	.80	.07	.41	.16
Errors	-.27	-.30	.25	-.42	.40	.36
Labels	.35	.36	-.36	.37	-.61	-.35
Verbal Participation	.06	.08	.02	.69	-.14	-.12
Inhibition	-.18	-.06	-.07	-.17	.36	.28
Spuriously Successful Placement	-.22	-.18	.12	-.13	.45	.15
Non-meaningful Placement	-.35	-.38	.28	-.28	.48	.39
Interruptive Distraction	.07	-.10	.36	.06	.19	.14
Test Period Inhibition	-.22	-.17	.04	-.16	.20	.49
Test Period Non-meaningful Placement	-.28	-.31	.22	-.18	.26	.77
Toys Sorting Task Score	.32	.33	-.33	.20	-.27	-.23
Block Sorting Task Score	.43	.44	-.37	.36	-.54	-.53
Etch-a-Sketch Score	.48	.20	-.19	.05	-.36	-.13

* $p < .05$ when $\underline{r} \geq \pm .16$
$p < .01$ when $\underline{r} \geq \pm .21$

Table V-6 presents the correlations of the mother and child measures with intelligence test scores and with four general measures which represent combinations of some of the measures listed above. Two of the new measures are factor scores obtained from a matrix including both mother and child variables, in contrast to the earlier-described factors which were obtained from separate matrices. These two factors were obtained through an image-covariance method and are orthogonal with respect to each other.

The first of the two factors has been labeled a "tug-of-war" factor, because cases high on the factor had high scores on variables reflecting inattention and resistance by the child and high use of coercive control by the mother. Such cases were marked by continued conflict between mother and child, with the mother struggling to obtain compliance through coercion.

The second of the new factors, orthogonal to the first, has been labeled "verbal task interaction" factor. Cases high on the factor were characterized by high use of labels by both the mother and the child, low rates of error in the child's responses, and a general emphasis on verbal as opposed to physical feedback. Cases low on the factor tended to have low maternal use of specific labels and requests for verbal feedback in combination with a high rate of errors in the child's responses.

The two remaining columns in Table V-6 represent combination scores for the child's behavior variables. These two columns are included to show the effect of combining groups of children coded on the separate behavior variables so that the correlation becomes "problem vs no problem" rather than "particular problem vs. all other cases."

The teaching period combination score combines four measures of child behavior during the teaching task. All children coded for inhibition in responding or spuriously successful placement, as well as all children who exceeded a specific cutting score for resistance and non-meaningful placement, were scored "1" on the teaching period combination score (the cutting score was set at a level which separated cases in which the problem was continuous from those involving only a single incident of resistance or non-meaningful placement). Children who met none of these criteria were scored "0." Thus, this score reflects high vs. low occurrence of one or more of the task-interfering child behavior variables.

The test period combination score similarly combines individual measures of child behavior during the test period. Children manifesting inhibition or non-meaningful placement in the test period were scored "present," while all other children were scored "absent."

The high correlations obtained when the child variables are combined in these two categorization scores results from the fact that the child behavior variables are unrelated or negatively related to one another. This means that in many of the cases in which a given undesirable variable was coded as absent, one or more of the others was present. Since the various child variables tended to be negatively related to maternal teaching measures and to task performance scores, the contrast between children "present" or "high" on a given variable with children "absent" or "low" on that variable was reduced because of the effects of the other child variables in the "absent" group. Combination of the various child variables into a single group caused their corresponding correlations with maternal teaching measures and performance scores to become cumulative rather than conflicting, producing the highly significant correlations seen in Table V-6. Similar results were obtained when a given child variable was evaluated with respect to only those cases in which no undesirable child variable was present (thus eliminating many cases containing poor teaching and low performance scores associated with other behavior variables).

Discussion

Thus far we have defined several maternal and child variables obtained in the interaction situations, and presented their correlations with one another and with intelligence test and interaction performance. It is now appropriate to summarize and integrate this information and to discuss the implications of mother-child communication for the development of cognition and educability. From the data contained in Tables V-1 through V-6, one may infer a variety of functional relationships among mother-child communication variables. These inferences are based on the similarities and differences in patterns of intercorrelation among the variables. Since the data are basically correlational, however, the inferences drawn will depend upon the assumptions made concerning the similarities and differences among the variables and the kinds of antecedent and consequent relationships expected. In drawing inferences from the correlations the data were approached with the following assumptions:

Generality-Uniqueness

Gross differences among the mothers in such variables as education, intelligence, and specific experience can be expected to produce gross differences in communication skills. Consequently, some intercorrelation of variables is to be expected, with a mother who is toward the optimal end on one measure expected to be toward the optimal end on the others. Since the variables reflect different aspects of maternal behavior, however, they are also to some degree unique both in terms of intercorrelations with other maternal variables and in the expected relationships with child variables. Sub-groups of variables may be similar or different according to their standing with respect to some more general dimensions of behavior. One such criterion already discussed is the mother's intention (giving information, obtaining information, engaging, or coercing). Other criteria are introduced in the following assumptions.

Proactive-Reactive

Some maternal behavior may be considered proactive in the sense that it is initiated by internal events (previously formulated plans based on integration of past experience or conclusions drawn from the present situation). Other behavior is reactive in the sense that it is structured by the stimulus conditions inherent in the task or is an immediate response to activity by the child. Thus, initial attempts to motivate the child and to provide orientation while he listens passively would be considered proactive, while attempts to correct errors or counteract inattention would be considered reactive.

This dimension is seen as continuous rather than discrete, with maternal behavior considered proactive to the extent that it represents something beyond the minimal requirements of the immediate situation.

Levels of Complexity

This assumption, related in part to the previous one, implies that the variables may be arranged in hierarchical orders of difficulty or complexity. Evidence for this assertion comes from a consideration of the kinds of behavior each variable represents, from differences among the variables in the way that they relate to intelligence test data, and from the relative differences in the degree to which mothers of contrasting social status and education were able to approach optimal levels of the behavior involved.

Among the specificity variables, for example, the scores for verbalization of labels in post-response feedback were usually much higher than the corresponding scores for pre-response instructions. In addition, maternal specificity of instructions was more closely related to maternal IQ than was specificity of feedback responses, and the relative difference between the middle and lower social class groups was much greater for instructions than for feedback measures. This suggests that a given level of specificity in pre-response instructions is more complex and difficult for a mother to attain than the identical level of specificity in post-response feedback.

Plurality of Antecedent and Consequent Functions

In drawing inferences from the data in Tables V-1 through V-6, we will specify functional relationships between the mother and child variables, generally treating the mother variables as antecedents and the child variables as consequences. In studying parent-child interaction it is also possible to take the opposite approach, and evaluate the child's effects upon the parent. However, the focus of this research is on the maternal effects upon the child, and the design of instruments and development of measurement methodology were geared to that purpose.

The relationships specified between maternal antecedents and child consequences are interpreted as functional and contingent rather than necessary or sufficient. This is because mother-child communication represents an open, dynamic system of extreme complexity, so that a given child variable may require the interaction of several maternal variables as antecedents. Conversely, different children may react differently to similar antecedent conditions, as when one child becomes inhibited while another becomes resistant.

Most of the significant correlations obtained between mother and child variables concern the maternal measures of specificity and of praise and engagement and the child variables of response quality and performance scores. The measures of maternal attempts to regulate the child's attention and the quality of his responses and the measures of resistance and interruptive distraction in the child tended to interrelate consistently with one another but not with the other variables in the matrices. Thus, the methods the mothers used to influence their children (praise and engagement vs. coercive control) were related to their general teaching effectiveness and success, while their objective success (independent of methods used) at counteracting inattention and carelessness by the child was unrelated to other measures of teaching and learning.

The apparent reason that the maternal measures of demand for attention and response quality and the child measures of resistance and distraction tend to correlate only with one another and not with other variables in the matrices is that all four of these measures are related only indirectly to the child's learning. The proactive-reactive dimension applies to the child's role in the task as well as to the mother's, so that successful learning is impossible or at least very difficult if the child does not actively attempt to process the stimuli and remember the verbal labels. He may not have this intention continuously throughout the task, but he must adopt it when listening to the mother's presentation at some point during the interaction if he is to learn it properly.

All the child variables discussed above imply absence of optimal conditions in the child. They differ, however, in their implication. Resistance and distraction have in common the fact that they represent attitudes toward the task as a whole rather than qualities of specific task responses. In effect, these reactions involve a suspension of the task, a period in which the child is refusing to do the task and the mother must do something about it. They imply nothing directly about the quality of the child's performance when he is doing the task. Even if resistance or distraction is intense or prolonged, the child may be able to learn successfully if the mother is able to elicit his cooperation in between or after such episodes.

In contrast to the preceding variables, the variables of inhibition, non-meaningful placement, and spuriously successful placement may be considered to be direct evidence of maladaptive behavior in the task responses themselves. Presence of this type of behavior implies directly that optimal learning has not taken place.

A similar contrast exists between the labels and the errors factors. The labels factor directly reflects the degree to which the child has been able to learn and apply the relevant labels. His ability to do so shows that adequate learning has occurred during at least some of the time prior to the production of the label. The evidence is unambiguous because the production of verbal labels is a response which the child either can or cannot make. In contrast, the errors factor is less directly related to the quality of the child's learning. Although many errors may be due to a maladaptive response process in the child, others simply reflect differences among the children in intelligence or among the mothers in teaching specificity.

The point of the preceding distinctions is that some measures bear directly upon the quality of the child's responses during the task, while others do not, the latter being correlated because they represent indirect evidence (statements of probability) of difficulties with the child's cooperation or task motivation. This distinction is important to the discussion of the maternal measures of demand for attention and response quality, because the pattern of intercorrelation in Tables V-1 through V-5 shows that these measures tend to relate primarily to the indirect indices of the child's performance and not to the direct ones. While this may be an artifact of measurement methodology, it seems more likely that it is due to the inherent nature of the maternal variables being studied. The measures of maternal demand for attention and response quality are primarily measures of counteraction against overt, undesirable behavior in the child. Consequently, although mothers rated high on these measures were able to obtain at least tacit compliance from their children, they were not necessarily able to elicit or instill optimal levels of interest in the task and desire to learn. A certain minimal amount of regulation of the child's behavior was necessary to make instruction possible, but in order to teach successfully the mother had to do more than counteract resistance and distraction.

The data in Tables V-1 through V-5 clearly show that the more successful mothers, in addition to being more specific in their teaching, tended to rely on praise and engagement rather than coercion as their means of motivating the children. Although an equivalent amount of regulation of the child's overt behavior can be achieved through either method, differences in method may be expected to have contrasting effects upon the child's internal subjective state. The mother who motivates through praise and engagement provides an inducement for the child to participate in the task and follows this up with encouragement and praise which tend to make the task a pleasant experience for him. In contrast, the mother who confines herself to criticism and coercive control encourages the development of an avoidance orientation in the child and in effect makes the task itself a punishment.

The findings on maternal methods of obtaining the child's interest and cooperation in the interaction are closely related to the data on maternal control strategies described in the previous chapter, and similar inferences may be derived concerning their effects on the children. Mothers who attempt to motivate the child through engagement and presentation of information are usually person-oriented in their appeal, and their statements are usually instructive as well as motivating. Mothers who rely on coercive control, on the other hand, are usually confined to imperative commands appealing to status-normative rationales. Illustrations of these differences are provided below in examples which are typical but not verbatim responses. Each pair of examples represents contrasting maternal behavior in response to the same antecedent situation. The examples in the left column involve the use of engagement and presentation of information, while those on the right are confined to coercive control and criticism.

1a. I've got another game to teach you.

1b. There's another thing you have to learn here, so sit down and pay attention.

2a. Now listen to Mommy carefully and watch what I do 'cause I'm gonna show you how we play the game.

2b. Pay attention now and get it right, 'cause you're gonna have to show the lady how to do it later.

3a. No, Johnny. That's a big one. Remember we're going to keep the big ones separate from the little ones.

3b. No, that's not what I showed you! Put that with the big ones where it belongs.

4a. Wait a minute, Johnny. You have to look at the block first before you try to find where it goes. Now pick it up again and look at it--is it big or small? . . . Now put it where it goes.	4b. That doesn't go there--you're just guessing. I'm trying to show you how to do this and you're just putting them any old place. Now pick it up and do it again and this time do it right.
5a. No, we can't stop now, Johnny. Mrs. Smith wants me to show you how to do this so you can do it for her. Now if you pay close attention and let Mommy teach you, you can learn how to do it and show her, and then you'll have some time to play.	5b. Now you're playing around and you don't even know how to do this. You want me to call the lady? You better listen to what I'm saying and quit playing around or I'm going to call the lady in on you and see how you like that.

The above examples are typical of the maternal statements observed in the interaction tasks. They were chosen to represent contrasting maternal reactions to the same basic stimulus on the part of the child. The difference in appeal (instructive vs. imperative; person vs. status) is one of degree, being sometimes quite obvious and sometimes very subtle. For each pair of examples, however, the statement in the left column is superior to the one in the right column in one or more of the following ways:

1. It is more conducive to the consideration of alternatives for thought and action (see preceding chapter).
2. It represents an appeal to logical contingencies or personal considerations rather than an arbitrary exercise of power.
3. It presents the task as desirable, either as an end in itself or as a means to a desired end, rather than as a chore or an arbitrary demand made upon the child.
4. It places the mother in the role of a supportive sponsor or helper rather than an impersonal or punitive authority figure.
5. It defines the situation as a cooperative venture in which the mother has some responsibility rather than as something that involves the child alone.
6. It specifies immediate means rather than merely repeating ultimate goals.
7. It connotes cooperation, affiliation, and positive expectation of success, as opposed to conflict, withdrawal of positive regard, and emphasis on failure.

Despite the desirable effects that these techniques might be expected to have upon the children, most of the mothers made relatively little use of praise and engagement. Mothers of different education and background differed very little in their relative use of coercive control, but the middle-class mothers were the only social status group to praise their children or attempt to engage their interest in the tasks with regularity. In all four social status groups the use of coercive control exceeded the use of engagement techniques. However, among middle-class mothers the difference was very slight, while among working-class mothers the frequency of engagement was far below that of coercion.

The data on maternal motivation techniques appear to provide part of the explanation for the high rate of teaching difficulty and undesirable child behaviors observed in the interactions. The majority of mothers made relatively little attempt to elicit the child's interest through positive engagement, but instead were apt to react to problems by attempting to force compliance through coercion. In view of this it is easy to see how any initial positive feelings about the task that the child may have had became quickly dissipated and replaced by a failure-avoidance orientation, especially when coercive control was combined with poor teaching so that successful learning was made difficult.

The data for the affirmation/negation balance measure parallel those for the use of praise and engagement vs. coercion and criticism. It will be recalled that the affirmation/negation balance measure refers to the mother's immediate reactions of confirmation or negation following the child's responses. For the sample as a whole, the rate of affirmation and the rate of negation were almost equal. However, there was again a large social status difference due primarily to differences in the rates of affirmation following successful responses. The balance ratio for the middle-class group was 0.57, while the corresponding ratio for the combined working-class groups (which did not differ among themselves) was 0.45. This differential was even more pronounced in the absolute frequencies of affirmation and negation, since correlated differences in maternal teaching specificity produced relatively higher rates of success and lower rates of error among the middle-class children as contrasted with the working-class children.

The measures of maternal specificity in three separate areas of teaching (orientation, pre-response instructions, and post-response feedback) correlated positively with one another and with the measure of overall verbal specificity, and these measures in turn correlated positively with the mother's tendency to seek specific (verbal) feedback from the child and negatively with her tendency to seek non-specific (physical) feedback. This means that each mother's level of proficiency relative to that of the other mothers in the sample was relatively consistent across the various measures.

Because of differences among the variables in the degree to which the behavior they represented was proactive, however, the absolute levels of performance of individual mothers and of the group as a whole differed considerably from variable to variable. In the block sorting task, for example, the mothers verbalized or elicited the appropriate label in 71% of the instances in which they were correcting placement errors by the children. The rates of specificity dropped, however, when antecedent conditions tending to produce it were reduced or eliminated. Thus, the rate of verbalization of labels dropped to 32% in the feedback following correct placement responses, 23% in the instructions preceding specific placements, and 19% in the general instructions preceding placement units. In the Etch-a-Sketch task, where consistent specificity was more obviously necessary (since errors were irreparable), the absolute rates were much higher. The direction in which the child was to turn the knob was specified in about 45% of the mother's pre-response instructions, and specific correction followed virtually every error since construction of figures could not continue without it.

The rates of non-verbal focusing behaviors with which the mothers supplemented their verbalizing of labels varied from situation to situation in correspondence with the rates of verbal specificity just described. Focusing attempts appeared less frequently, however, being present in about 35% of the instances in which mothers used specific labels.

There were also differences in degree of specificity with both labeling and focusing. For example, a group of blocks could be described verbally in language which referred to the general attributes of height and mark ("These blocks are all the same height and have the same mark") rather than the appropriate sub-types of the attribute ("These blocks are all tall and marked with X"). The latter statement is considered more specific in that it promotes discrimination of the qualities that differentiate the particular group from the others, and makes a statement that applies uniquely to the particular group rather than to all four groups. Similar distinctions could be made among the focusing attempts. A mother could help her child focus on the relevant attributes of the blocks by pointing at or holding her hand over spatially separated blocks or groups. She could make her message even more effective, however, by placing contrasting blocks adjacent to each other and emphasizing the differences by pointing or moving her hand back and forth.

Focusing rates were also affected by the attributes of the stimuli themselves. Focusing appeared much more frequently in connection with the marks than it did with the heights of the blocks, because the marks were concrete entities which could be indicated by pointing, whereas similarities and differences in the heights of the blocks had to be indicated through more complex hand motions.

These various differences in degree of specificity in labeling and focusing behavior are relevant in that they represent differences in the proactive-reactive dimension and they correlate positively (although weakly) with performance scores. However, instances of labeling or focusing where the degree of specificity is particularly rich or complex are relatively rare in the data, so that the frequency with which specificity in any form is present is the most meaningful variable. In a sample consisting of mothers of superior intelligence or of experienced teachers, the opposite situation might be the case.

By combining the preceding comments on the data in Tables V-1 through V-5, it is possible to construct a hierarchy of maternal communication as observed in the interaction tasks. The range extends from the most reactive styles, characterized by limited techniques and restricted verbal expression, to the most proactive styles, characterized by an organized and diversified repertoire of techniques and elaborated verbal articulation. The lowest level would be represented by mothers who limited themselves primarily to physical feedback requests preceded by little or no orientation or pre-response instructions and followed by corrective feedback of low specificity.

In a few extreme cases observed in our sample, attention was confined almost entirely to the physical or block-placement aspects of the task, with little or no emphasis given to the sorting principle. In such cases the mother's method was to demonstrate block placement for the child and then to ask him to do it himself, giving feedback and continuing this practice until the child had learned where each block went. Specific labels in the feedback, when they occurred at all, tended to be given in an off-hand manner which did not clearly indicate the importance or relevance of the attribute. Consider the following passage, constructed to illustrate the teaching methods of mothers who were very low in specificity:

> I have some blocks here and you have to learn how to put them where they go. Watch me now so you'll learn how to do it. See, this one goes here, and this one goes here, and this one goes here with the big ones, and this one goes here. See how they go now? These are all the same, these are all the same, these are all the same, and tnese are all the same. can you do that now for Mommy? Let's see you do it for me. . . . That's right . . . No . . . No . . . That's not right. It goes here with the big ones. . . No, over here. . . . Ok. Can you do that again?

The preceding example demonstrates the kind of teaching that resulted when the mother made no attempt to specify the relationship between the attributes of the blocks and the physical act of sorting them into separate groups. This is comparable to the situation in which a programmer would ask the machine to divide a deck of cards into subgroups without telling it which columns to scan as the basis for separation into groups. The machine would be unable to interpret such instructions and could not act on them. Children, however, can and do react, at least to that portion of the instructions which they can understand. To a degree this is an advantage for a mother with a primarily reactive teaching style, for if the child begins responding and making errors, the mother may see that he does not understand the task and may try to correct him. In the process of correction she often may fill in the gaps in her teaching program so that the child can make the connection between the attributes of the blocks and the sorting principle and conceivably learn the task, although by a long and disorganized trial and error method.

This "do as I do" approach, however, with its emphasis on the placement responses at the expense of discussion of the sorting principle, can cause the child to view the task as a guessing game or a rote memory exercise. Problems also arise if the child is successful in learning where to place the blocks, since this may cause the mother to assume mistakenly that he has mastered the sorting principle and will be able to generalize it to new blocks. Even where this does not happen, a mother who starts out with this reactive style may encounter difficulties later when she tries to teach the sorting principle. The danger in such cases is that the child, feeling that he has succeeded by memorizing where to put the blocks, will view the mother's attempts to teach the sorting principle as an unnecessary and undesirable prolongation of the exercise. We will return to this point later in discussing the child behavior variables and their relationships to the maternal teaching variables.

As we move away from the example above toward more sophisticated levels of maternal communication, the general degree of specificity rises. The most noticeable difference is in the feedback messages, especially in reaction to errors by the child. The attributes of the blocks are labeled more frequently and are more clearly tied in to the sorting operations. More attempts at orientation appear, although they tend to be restricted to presentation of the concepts of height and mark (as opposed to the sorting principle per se) and to primarily verbal behavior supplemented only minimally by focusing attempts.

A major difference is increased emphasis on seeking verbal feedback from the child in addition to placement responses. Getting the child to produce the verbal labels and give reasons for his sorting responses was of course important in this task, although its usefulness as an aid to the child's understanding and its general effects upon the child must be evaluated in the context of the mother's general specificity.

While the evidence clearly indicated that over-emphasis on physical feedback had undesirable results, emphasis on verbal feedback did not produce desirable results in and of itself. It is true that consistent and successful production of labels by the children tended to occur only in cases where the mother stressed verbal feedback. The converse, however, is not true, since the frequency with which the child was asked to produce labels did not determine his ability to do so. In some cases the mothers persisted in asking the child to produce labels for the blocks when the child did not know them, apparently working on the assumption that the child's failure to respond was due to inhibition or resistance rather than lack of information. In such instances the adaptive response for the mother would have been to review her discussion of the attributes of the blocks and the labels that she wanted the child to use in referring to them, rather than to persist in her efforts to get the child to produce the labels himself. Persistent questioning in these situations not only did not help the child but may well have had undesirable effects upon his motivational state.

Another difficulty resulting from the interaction of verbal feedback requests with relatively low levels of maternal specificity occurred in a few cases characterized by inadequate focusing behavior and overuse of generic references to the attributes by the mother. The interaction in these cases often included sequences which amounted to a reversal of those scored as spuriously successful placement. That is, the child's placement responses would contain frequent errors but his explanations of the sorting principle would be consistently correct, at least on the surface. Examination of these cases revealed that the child invariably said that the blocks in a group went together because they had "the same height and the same mark." The unvarying manner with which this phrase was usually repeated, combined with the persistent placement errors and with poor performance on the post-task test, suggested that the children did not understand the meaning of the words that they were pronouncing--that they were parroting back to the mother an all-purpose phrase which satisfied her questions.

Teaching styles still higher on the communication skill hierarchy are characterized by an increase in specificity in general, but especially in the area of focusing behavior. Verbalization of labels appears occasionally in the pre-response instructions, frequently in feedback following correct responses, and always in feedback following errors. Focusing attempts become more frequent and more specific, particularly in the orientation period and in the correction of errors.

Orientation tends to be longer and to involve a presentation of the sorting principle in addition to a discussion of the attributes of height and mark.

The importance of adequate focusing behavior on the part of the mother, especially in the orientation period, cannot be overemphasized. Communication of a specific message from mother to child requires that there be isomorphism between the meanings which the mother and child attach to specific words. As the above example of children who could parrot the sorting principle illustrates, the mere fact that a child has heard his mother use a word, or even has used it himself, does not necessarily guarantee that he knows its meaning or understands the way that the mother is using it. Failure to understand the message is rarely a problem in discipline commands or similar messages from the mother which involve simple words and ideas well-known to the child ("Put away the ball"). However, to the extent that the message involves unfamiliar words, that the referents of the words are abstract, and that the interrelationships involved become more numerous or more complex, it becomes increasingly necessary for the mother to supplement her verbal message with non-verbal focusing behavior. The importance of focusing in the interaction tasks can be inferred from Tables V-1, V-2, and V-5. The measure of general verbal specificity (which does not involve any focusing behavior) tended to correlate less strongly and consitently with other variables than did the other measures of maternal teaching specificity which contain focusing behaviors as well as labeling behavior in their derivation.

The function of focusing behavior is to help the child make the connection between the verbal label and the referent attribute of the blocks. The effect of such behavior as pointing to the marks, demonstrating the height with hand motions, and picking out specific blocks to contrast with each other in close physical proximity, is to increase the saliency of the relevant attributes of the block in the child's perceptual field. The attributes of the blocks or any other stimuli vary in their relative saliency to the perceiver, so that some attributes stand out as focal qualities, others of lower salience function as background qualities, and still others may not be perceived at all. The mother can alter this situation through her focusing behavior by changing the previously existing hierarchies so that the stimulus attributes relevant to the task at hand become the most salient, at least for the moment.

The focusing process was important in the block sorting task for two separate operations. The first concerned attention and perception of the attribute as a generic variable. In order to follow the mother's program, the child had to understand that when she used words such as "mark," "X," "O," or their synonyms, she was referring to the white symbols on the ends of the blocks. Focusing behavior on the part of the mother directed the child's attention to this aspect of the blocks; when it continually occurred in contiguity with or immediately following the verbalization of labels, focusing served to strengthen the association between the label and the physical referent and to increase the likelihood that verbalization of a label would evoke attention to the relevant attribute by the child.

The second function of focusing behavior was to promote discrimination of contrasting examples of the attribute (X vs. O, tall vs. short).

Discriminations allowed matching and contrasting of the relevant attributes which provided the basis for sorting. Maximum specificity occurred when the mother used labels applicable to only one block or group (rather than to all the blocks), when she liberally supplemented her presentation with focusing behavior, stressed both similarities and differences among the blocks, and then coordinated this separate information in an operational description of the process by which the child was to proceed. This will be shown as part of the example below.

Optimal maternal communication implies high levels of specificity in all areas previously discussed, in both labeling and focusing behavior. This included not only orientation and feedback but also pre-response instructions, where specificity occurred least frequently. It also implies a preference for eliciting the child's interest in the task through engagement and for maintaining it through encouragement and praise. An additional element, not discussed previously, was sequential organization. Ideally the mother would proceed in a step-by-step process, introducing sub-parts of the task before requiring the child to make responses which assumed prior knowledge of those sub-parts. An idealized example of this kind of teaching is presented below, along with interpretive comments analyzing the function of each step.

Maternal Behavior	Interpretation
Hi, Johnny. Sit down here by Mommy because I've got something to show you. It's a game that you play using these blocks here. There's a special way that you can put blocks together in different groups here on the board. I'll show you how to do it, and then you can show Mrs. Smith (the tester) when she comes back.	With these few brief remarks, the mother manages to: 1) greet the child warmly, 2) give the child a general overview of what is to come without getting into specific details, 3) describe the task ("game") in a positive manner, connoting that the child will enjoy it, 4) refer to the post-task test in a way that suggests that it is an opportunity for the child to show off his knowledge to a known person, rather than picture it as an arduous trial conducted by a feared authority figure, and 5) subtly but consistently stress the importance of the sorting rationale (that is, the task involves learning a method which will tell how to sort the blocks, as opposed to a task requiring the child to learn where to put the blocks).
OK?	This simple pause in the teaching has several functions. 1) It provides a check on the child's attention and cooperation. 2) It allows the child to express any objection to the task itself or

(Maternal Behavior)	(Interpretation)
	interests in non-task activities which are competing with his willingness to attend to the mother. If the child does have objections or competing interests, it is important for the mother to deal with them at this point, before the introduction of formal teaching, since teaching will proceed more smoothly if the child is interested and cooperative. 3) It allows the child to ask questions which will enable the mother to clarify or expand some part of her remarks.
All right, now there are two things about the blocks that you have to remember. You have to look at the size of the block to see whether it's tall or short, and you have to see what kind of mark the block has on it. Now look at these two blocks (placing a tall and a short next to each other). This one is bigger than this one, isn't it? This one is tall, and this one is short (putting hand over tops of the two blocks and moving hand back and forth). Now look at the other blocks. Some of them are tall like this one, and some of them are short like this one. What about this block? Is it tall or short? . . . Right. And this one? . . . Fine. (Replacing the other two blocks and getting two blocks of contrasting mark) Now the second thing we have to look at is the mark on the blocks. Notice each of these blocks has a white mark on each end (showing each end of the blocks to the child). Now this block has these two crossed lines here (tracing with finger), see? Now what do we call that mark? We call that an *X*. That's an *X*. Now this block has a round mark on it (tracing), and we call that an *O*. That's an *O*.	This example represents a highly organized presentation of the relevant attributes, with high specificity both in verbal labeling and in focusing behavior. The mother begins by stating the relevance of what is to come to the ultimate goal of the task, that is, that the child needs to know the two things that she is about to teach him in order to know how to group the blocks. However, she avoids overwhelming the child by trying to put them all together at once, and instead confines herself to introducing the relevant attributes. To further simplify the presentation she introduces the attributes one at a time rather than in combination, and she presents each term with specificity and a certain amount of redundancy before requiring the child to use it himself. She does, however, require the child to produce labels, getting specific feedback from him rather than simply assuming that he has understood, and she affirms each correct response as it appears. To make sure that the child is attending to the appropriate aspects of the blocks, his mother asks him to label blocks that she has not already discussed. Her

(Maternal Behavior)	(Interpretation)
So this one is X and that one is O. What are they now? . . . Right. And what's the mark on this one here? . . . OK, and this one? . . . Right.	periodic seeking of feedback allows the child to assume the role of an active participant rather than of a passive listener. The order and specificity in the presentation maximize the child's chances of learning quickly and easily, which in turn maximizes the likelihood of successful response and positive reinforcement rather than failure and negative reinforcement.
Now when we divide up the blocks into groups, we have to see whether they're tall or short and whether they have X or O. The blocks in each separate group should be the same size and should have the same mark on top of them. Now look at this group. Both of the blocks are tall, not little like these other ones here and here--they're both tall and they both have the same mark on top. See (pointing)--they both have X. Now that's why they go together, because they're both tall and they both have X on top. Now look at this group; these blocks are both tall, too, but they both have O on top, so they go by themselves--they're tall with O (pointing). Now the blocks in this group go together because they're both short and because they both have (showing the ends of the blocks to the child)? . . . X, right. And the blocks in the last group go together because they're both (holding hand over tops of blocks)? . . . short, and they both have (showing ends of blocks to child)? . . . O, right. Now that's what we have to know when we put these extra blocks into their groups on the board. The blocks in each group should be the same size and they should have the same mark on top. Now this block is tall and has	In this sequence the mother first shows how the blocks in each group already formed on the board have the same height and mark, and then goes on to demonstrate the method of placing the blocks. Throughout the presentation she consistently emphasizes both similarities and differences among the blocks and carefully specifies the relationship between the attributes of height and mark and the basis upon which the groups are formed. In demonstrating sorting she operationally describes each step so that the child sees that the actual placement is the end result of a series of decisions based on evaluation of the similarities and differences among the blocks. By thus operationalizing the sorting process, the mother can help the child to see the end result as a natural outcome following a series of understandable, goal-oriented steps, and not simply as a *fait accompli* to be accepted but not understood. This is an important consideration, because Piaget (1951) has shown that a child of this age will not ordinarily ask how an adult is able to do such a thing, or seek a logical, operational explanation. He may, however, accept the assertion that the block does indeed belong in the group that the mother says it

(Maternal Behavior)	(Interpretation)
an X on top, so I want to find some other blocks that are tall and have X on top to put it with. This group has tall blocks and both have X (pointing) just like the block in my hand, so that's where it goes. Now look at this block. It's a short one and it has an 0 on top (pointing). Now we want to find the group that has the same size and the same mark on top. (Placing block with tall 0's) Now these blocks have 0 on top, but they're big ones and this one is a little one, so it couldn't go there. (Placing with small X's) These blocks are the same size--they're both small--but they have X's on top, so the marks aren't the same (pointing), so it can't go there either. (Placing with short 0's) But these blocks are both short and they both have 0 on top, just like the one in my hand. So that's where it goes--it goes with other blocks that are short and have 0 on top. (Mother continues in similar fashion for the other two blocks.)	belongs in, taking this as a fact which requires no explanation or which is ascribed to magical properties thought to reside in the mother or the stimuli themselves. Mothers who failed to verbalize the logical operations behind the sorting process often unwittingly encouraged this kind of response in the children, especially if in addition they neglected to ask the child to explain on his own the reasons for placement.
Now do you want to try it? . . . OK, I'll take a block out of each group and we'll let you put them back where they go. (Mother removes a block from each group and hands one block to the child) Now remember, we want to fix them so that the blocks in each group are the same size and have the same mark on top. Now look at this block--is it tall or short? . . . OK, and does it have an X or an 0 on it? . . . Right, so we want to put it in the group that has short blocks with 0 on them. Can you find that group? (Child places block with short X's.) Well, those	This sequence represents a continuation and extension of the same principles illustrated in the earlier ones. Before definitively concluding her demonstration and moving on to the first placement response, the mother consults the child regarding his willingness to try placing the blocks himself. This provides a check on the child's motivational state and in addition gives him an opportunity to express confusion or to seek further information or demonstration. After eliciting the child's consent, the mother then moves on to the placement unit, although not without giving him considerable

(Maternal Behavior)	(Interpretation)
are short, all right, but what about the marks? Look at them—is the mark on this block the same as the mark on those two blocks? No--those are X's. So you have to find the group that has short blocks with O on top . . . That's right--fine. Now the blocks in that group are all short and they all have O on top. Now how about this block. Is it tall or short? . . . OK, and what mark is that? . . . Fine, now can you find the group that has tall blocks with X on top? . . . Good. Now why does that go there, Johnny? It goes there because these blocks are all tall and have what on top? . . . Right. (Mother continues in a similar vein, although as the child's knowledge becomes more secure, she gradually reduces the frequency of prompting in specific instructions and gradually increases her attempts to elicit this material by questioning the child until eventually he is able to sort and to verbalize the sorting principle correctly on each trial.)	additional help before allowing him to actually place a block. She first restates the sorting principle in the form of a global description of the task, and then follows through with specific instructions concerning the first block. All of this helps the child to respond correctly, but more importantly it stresses the cognitive operations which the child is to pursue. The emphasis throughout is on processing of the blocks before placement and verbalization of the sorting principle after placement. The demands made upon the child are gradually increased at a rate corresponding to his increasing ability to cope with them. The mother regularly provides immediate affirmation or negation after each response, although her responses to errors are problem-centered and informative rather than critical. Her general role is that of a friendly helper rather than an impersonal or critical evaluator.

The preceding example of maternal teaching, particularly if read from beginning to end without attention to the interpretive comments, may not seem particularly noteworthy or impressive. It has a natural, almost familiar quality which tempts the reader to think, "Well, that's about how I would explain it myself." In a sense this reaction is perfectly valid, since the presentation appeals to common sense as a straightforward way of presenting the block sorting task which involves no unusual didactic techniques or specially prepared equipment. Most if not all of the principles discussed and illustrated are well known, appearing routinely in works on teaching and learning (cf. Ausubel, 1963; Gagné, 1965). This simplicity is more apparent than real, however, since teaching which approached the ideal outlined above was very rarely observed in this research. Paradoxically, the example seems simple partly because of its high clarity, specificity, and organization. It is so easy to follow that it makes learning the task seem easy. However, for the mothers in our study, who had to teach it to their children without benefit of previous discussion and analysis, the task proved to be quite difficult. Despite the fact that no time limit on teaching was imposed, only 10 of 162 children received perfect scores on the post-task test.

Since each of the mothers knew the task herself, at least well enough to meet our criteria, why were there such gross differences among the mothers in their ability to teach it to their children? Part of the answer, of course, is that mothers differed in general intelligence, academic education, and breadth of experience which made them relatively more or less well-prepared for the task. The past history of interaction between the mother and her particular child was also important, since the mothers presumably differed in their experience in teaching children, and the children differed in the degree to which they were willing to cooperate in such a task. Two additional factors which appear to be related to the observed differences are the mothers' ability to abstract the essentials of the task and encode them in language, and to interpret and respond to the children's behavior. The best teaching was distinguished from that which was adequate but less ideal primarily in the careful organization and sequencing of the presentation. It is likely that mothers who taught this way were able to make an implicit or even explicit task-analysis of the situation, abstracting the essentials into an orderly sequence of sub-parts leading to an ultimate goal. Many mothers presented all the essentials in adequately specific language but lacked this kind of organization, so that they frequently had to backtrack or present new information as it became evident that the child did not completely understand.

Some mothers' teaching reflected a failure to understand the child's needs and limitations. This was evident in many ways, such as in failure to give orientation to the child or to attempt to gain his positive interest in the task, in failure to explain terminology or to supplement verbal presentation with nonverbal focusing, and in failure to properly interpret the child's actions. The latter difficulty was inferred from observation of maternal reactions to behavior such as non-meaningful and spuriously successful placement, which often were not recognized as such by the mothers. Some mothers allowed the children to establish a pattern of going from group to group until they reached the right one, or of placing the blocks quickly without giving any verbal labels, and made no observable attempt to break it. Such mothers seemed to simply project their view of the task onto the child or to assume that he was following the presentation and conceptualizing the task the same way they were, without attempting to test out this assumption.

Sometimes the mothers provided direct evidence of their own failure to properly interpret the children's behavior. Examples include those mothers who were surprised and dismayed to find during the test period that their children (previously coded for spuriously successful placement) were unable to place test blocks correctly. Other mothers handled inhibition poorly because they were unable to accept the child's protestations of ignorance, apparently believing instead that the child really knew how to put the blocks where they went but was for some reason unwilling to do so. Failure to distinguish between process and performance in block placement was often evident in mothers whose children were coded for non-meaningful placement, when the mothers made comments such as, "Now I thought you knew that one, Johnny--you got it right the last time."

Before discussing differences among the social status groups, some additional comments about the mothers should be made. Throughout the chapter, in discussing communication failures in the mothers' teaching, it has been stated or implied that poor teaching has undesirable effects on the children. It is important, however, to distinguish carefully between the mother's motives and intentions on the one hand and her actual behavior or performance on the other. The differences among mothers were primarily differences in means rather than ends or goals, since presumably the major goal of every mother in the interactions was to teach the task as we had requested her to do. It is also assumed that every mother, if questioned about the matter, would have stated her intention to make the task pleasant and enjoyable for her child in addition to making it a learning experience. Under these assumptions, then, the frequency of learning difficulties and undesirable reactions on the part of the children are considered unintended and unwanted by the mothers, resulting from inadequate communication skills rather than from any deliberate callousness or rejection of the child. Omissions and inadequacies are felt to have resulted from the fact that more desirable and effective methods simply did not occur to the mothers (limited repertoire in the proactive aspects of communication), or that the need for them was not perceived (inadequate reactive responses due to failure to recognize or interpret the process aspects of the children's responses). The net result of such communication, however, is that the ineffective mother not only fails to implement her goals but also unwittingly creates undesirable side effects.

The difference between effective and ineffective communication is not so much a difference between two clear-cut styles, if "style" is understood to mean a recognizably orderly and consistent approach. Instead, communication seems better conceptualized as a multi-dimensional activity ranging from the restrictive and reactive to the elaborated and proactive. The poor teaching seen in our observations was restricted and disorganized, but it was not accompanied by cavalier or hostile behavior toward the children. The difficulties encountered led to confusion, disappointment, and frustration, but not usually to hostility or rejection. This is reflected in the general affectionateness rating. Although maternal affectionateness was correlated positively with some of the specificity of teaching measures, the great majority of mothers were rated on the positive side of a love-hostility scale. That is, differences among the mothers in affectionateness are primarily differences in the degree to which they expressed positive affect, rather than a matter of acceptance and warmth vs. rejection and hostility.

Differences Associated with the Sex of the Children

Group data illustrating the variation in interaction measures according to the social status and sex of the children are presented in Tables V-7 and V-8. The data in Table V-7 are presented in standard error units in order to compare various measures on a single metric and avoid ambiguity concerning the direction of group differences in the

TABLE

T-statistics for Differences in Group Means on Inte-action

	Middle Class vs. Working Class		
	Skilled	Unskilled	
		Father Present	Father Absent
Orientation	3.52****	3.60****	4.00****
Requesting Block Placement	-3.66****	-3.78****	-5.25****
Requesting Labels	0.30	0.08	0.69
Specific Instructions	5.71****	6.74****	6.53****
Specific Feedback	1.26	2.31**	3.19***
General Verbal Specificity	1.64	0.97	2.82***
Affirmation/Negation	2.35**	2.99***	2.64***
Praise and Engagement	5.97****	4.48****	5.90****
Coercive Control	-1.65	-0.79	-1.48
Attention Demand	-0.21	-0.87	-0.37
Response Quality Demand	-0.75	-1.51	-0.57
Affectionateness	3.22***	2.40**	3.38***
Resistance	0.36	1.50	0.51
Errors	-1.43	-1.12	-2.66***
Labels	1.38	2.82***	3.25***
Verbal Participation	1.63	1.44	2.89***
Non-meaningful Placement	-2.28**	-2.96***	-3.26***
Interruptive Distraction	1.21	2.31**	0.45
Toys Sorting Task Score	1.162	1.139	1.803*
Block Sorting Task Score	3.01***	3.76****	5.47****
Etch-a-Sketch Score	2.30**	3.01***	1.92*

+The signs of the t-statistics reflect the actual direction of xxx

* $p < .10$ ** $p < .05$ *** $p < .01$ **** $p < .001$ (two-tailed

V-7

Measures for Four Social Status Groups and for Boys vs. Girls$^+$

Working Class: Skilled vs. Unskilled: Father Present	Working Class: Skilled vs. Unskilled: Father Absent	Working Class: Unskilled: Father Present vs. Father Absent	All Groups Combined: Boys vs. Girls
0.17	0.45	0.28	1.32
0.43	-0.09	-0.66	1.27
-0.21	0.39	0.57	1.87*
0.83	0.50	-0.37	1.28
0.82	1.54	0.80	2.32**
-0.63	1.13	1.74*	0.20
0.63	0.34	-0.28	-2.11**
-0.83	0.57	1.25	0.81
0.76	0.18	-0.59	0.00
-0.68	-0.18	0.45	1.44
-0.91	0.18	1.05	1.44
-0.67	0.17	0.83	-2.85***
1.24	0.16	-1.10	0.04
0.24	-1.22	-1.43	-0.25
1.13	1.66*	0.67	-0.22
-0.04	-0.98	0.93	0.55
-0.92	-1.21	-0.27	-1.70*
1.28	-0.76	-1.90*	-0.38
0.053	0.637	0.533	-1.094
0.94	2.29**	1.10	0.65
0.89	-0.32	-1.16	-0.52

group differences on the variable *as labeled*.

test)

TABLE V-8

Number of Children Demonstrating Various Problem Behaviors, Distribution by Social Status and Sex

Child Behavior	Social Status				Sex		Total
	Middle Class	Working Class					
		Skilled	Unskilled				
			Father Present	Father Absent	Boys	Girls	
	N=40	N=41	N=40	N=41	N=80	N=82	N=162
Inhibition	2	7	8	7	15	9	24
Spuriously Successful Placement	3	10	9	12	15	19	34
Test Period Inhibition	0	6	6	4	7	9	16
Test Period Non-meaningful Placement	4	4	10	16	17	17	34
Test Period Combination Score (Presence of Inhibition or Non-meaningful Placement)	4	10	16	20	24	26	50
Teaching Period Combination Score (Above Cutting Score Separating High vs. Low on Child Behavior Variables)	12	25	26	29	43	49	92

respective behavior (see Appendix K for a presentation of the group means and standard deviations upon which the t-statistics are based). In Table V-8, which contains data on the behavioral measures coded as present or absent, the actual frequency of occurrence in each group is given. Tests of statistical significance on these data were obtained through X^2 analysis and will be discussed below (for a complete presentation of the X^2 data, see Appendix L).

Differences among the children in performance scores and measures of behavior during the interaction tended to be small in magnitude (none reached the .05 level of significance in the two-tailed t-test) and inconsistent in direction. The maternal interaction measures, however, did show a consistent pattern related to the sex of the children, although few differences were statistically significant. The differences were in favor of mothers of boys on all measures of specificity of teaching (reaching significance for the specificity of feedback variable) and in favor of mothers of girls for the affirmation/negation balance and the affectionateness measure. Earlier research on maternal affectionateness toward preschool children has found greater affectionateness toward girls if and when a sex difference was observed, although the difference generally wanes and tends to disappear as the children get older (Sears, Maccoby, and Levin, 1957). The present data are compatible with these findings.

The data for the specificity measures, particularly in combination with the data for the affect measures, are compatible with previously reported findings (Crandall, 1963) that achievement is stressed earlier and given greater importance in the socialization of male children than female children. The data in Table V-7 suggest that the mothers of boys were more "business-like" in their interactions while the mothers of girls were more affectionate. Despite the greater affectionateness and greater use of affirmation with girls, the mothers of boys were higher (although not significantly) in the use of task-relevant praise and engagement. They were also less tolerant of inattention and lapses in response quality (but again not significantly). Taken together, these data suggest that mothers of boys were more concerned with their sons' cooperation and achievement than were mothers of girls, and that their affective responses to their sons were more closely tied to the sons' performance on the task than were the affective responses of mothers of girls.

Social Status Differences

Inspection of Tables V-7 and V-8 reveals that the most consistent and striking social status differences were those between the middle-class group and each of the three working-class groups, with differences among the three working-class groups being generally low in magnitude and only rarely significant. The magnitude of social class differences tended to vary with the proactive vs. reactive dimension described above, with the superiority of the middle-class mothers being most evident in the highly proactive variables, particularly in their use of specific pre-response instructions and of praise and engagement. Consistent differences in favor of the middle-class mothers appeared both in the measures of specificity of teaching and in the measures of affectionateness, affirmation/negation balance, and praise and engagement. None of the other measures showed a significant group difference, although the lower middle-class mean in use of coercive control approached statistical significance in its distance from two of the three working-class groups. The middle-class means on measures of demand for attention and demand for response quality were also lower, although the differences were not significant and interpretation of the latter variable is further complicated by the fact that this rating was not made in seven middle-class cases because difficulties in response quality never appeared (only four skilled working-class cases and only one case in each of the two unskilled groups were not rated for this reason). In summary, it may be said that the middle-class mothers were noteworthy for their attempts to elicit the child's interest and cooperation through reward-oriented techniques, while the motivational activities of the working-class mothers were more confined to attempts to control the children through demands and negative sanctions.

Variation in the child data showed interesting parallels with the social class differences in the maternal teaching measures, both in the kinds of differences observed and in the magnitude of these differences. The means for the middle-class children on both the resistance factor and the interruptive distraction score were above those for the working-class groups, although only one difference was significant. However, on the variables related to response quality, the middle-class children consistently obtained more optimal scores. This is seen in the data for the errors factor, the labels factor, and the non-meaningful placement score in Table V-7. As shown in the data of Table V-8, significantly fewer middle-class children were coded for spuriously successful block placement. Middle-class children were also coded for fewer cases of inhibition, although the frequency of this variable was too low to allow the differences to reach significance in the X^2 analysis. These data suggest that resistance toward or disinterest in the task among the middle-class children was resolved through the mothers' motivational activities. In contrast, the data for the working-class groups, particularly for the two unskilled groups, suggest that problems in these children were suppressed but not resolved, so that their task responses were often characterized more by punishment avoidance than by an approach-oriented attitude toward the task. Differences among the mothers in the specificity of their teaching dovetailed with the differences in regulation techniques, since the superior teaching of the middle-class mothers tended to promote success and thereby aided in making the task a positive experience for the children, while the lack of specificity in some of the working-class mothers' teaching tended to retard learning and increase failure experiences, further undermining the children's task motivation.

Rather than continue to discuss social class differences in maternal teaching styles in terms of factor scores and other general measures from the block sorting task, it seems useful at this time to introduce some examples taken from the Etch-a-Sketch task. It will be recalled that on the Etch-a-Sketch task the mothers and children had to work together to copy geometric designs, with the mother making the horizontal lines and the child making the vertical lines, each using his own button. Successful figure construction required only that the mother guide her child by telling him which way to turn his button before he began to turn and then when to stop turning as he reached the desired line length.

Two important maternal behaviors in the Etch-a-Sketch task were the mother's use of the models (which were drawn on 3" by 5" cards) and her directions to her child. The mother's use of the model was coded as present or absent for each of the five figures that she and her child constructed. The mother was coded "present" if she at any time during the construction of the particular figure under consideration showed the child the model by pointing to it, holding it up for him to look at, or specifically instructing him to look at it. This was a gross measure of the variable involved, since the mother was scored "present" if she showed the child the model even once, and since no adjustments were made for continual reference to the model or use of it as a visual aid for giving the child orientation directions or correcting errors.

The specificity of the mothers' turning directions to their children was measured in similar fashion. Each of a sample of twenty-five directions from each mother (her directions to her child on their first attempt at each of the five designs) was scored for presence or absence of specificity. A direction was considered specific if the mother attempted to tell the child which way to turn his knob before allowing him to turn it. Included were verbal directions referring to the line itself ("Go up;" "Bring the line down to my finger") or to the knob ("Turn towards Mommy;" "Turn towards the window"), as well as directions which involved circular hand motions by the mother to be imitated by the child. Relatively vague directions such as gross hand movements which were hard to interpret or verbal instructions that placed a large burden on the child such as "Turn the same way you did last time" were nevertheless scored as specific. Directions scored for absence of specificity were those in which the mother made no attempt to tell the child which way to turn his knob ("OK;" "You turn"). This measure taps only the mother's attempts to direct the child's knob-turning and not her actual success in doing so, so that no differentiation was made between instances where the child turned correctly and those in which he did not.

For both use of the models and specificity of turning directions, differentiation was made between presence and absence of the most basic examples of the behavior involved, rather than between levels of sophistication in the behavior when present. Nevertheless, striking social class differences were obtained.

Means for the four social status groups on these two variables are presented in Table V-9. Great differences between middle-class mothers and those in the other three groups were evident on both variables (the three working-class groups did not differ significantly among themselves). When we combine the data from the three working-class groups, we find that only 37% of the children's responses were preceded by specific directions; on the remaining 63% the children were simply told to turn their knob. The data for use of the design models are even more striking, since the children in the three working-class groups were shown the model which they were attempting to copy on only 23% of the trials. For the sample as a whole, 59 mothers (36%) never showed any of the design models to their children at any time during the interaction.

TABLE V-9

Performance of Four Social Status Groups on Two Measures of Maternal Teaching in the Etch-a-Sketch Task

Social Status	Use of models (mean number shown to child)	Specific turning directions (mean number of lines)
Middle Class (N=40)	3.6	17.2
Working Class:		
Skilled (N=41)	1.4	11.1
Unskilled:		
Father Present (N=40)	1.1	8.0
Father Absent (N=41)	0.9	9.0

Implications of the Interaction Data for Children's Educability

The data in Table V-9 are useful not only for the information they provide about social status differences in maternal teaching, but they also serve as a convenient basis for discussion of the role of meaning in mother-child communication. The Etch-a-Sketch task was a new and ambiguous situation for the children in which they were highly dependent upon their mothers to define for them the task as a whole and their particular role within it. The child with a mother who freely and consistently used the model and who regularly gave specific instructions would very likely perceive the task in a manner very similar to that of his mother. That is, he would be aware that he and his mother were making the specific design shown on the card and would learn that the lines had to be planned ahead if the model was to be duplicated precisely. He would function as a cooperative partner with his mother, working to achieve a common goal. His role would be an active one in which he had recognized responsibilities and contributions to make and which would allow him to share in the excitement of pursuing the goals and in the satisfactions gained upon reaching them.

In contrast, the meaning of the task for a child whose mother never showed him the model and who rarely or never gave specific directions was quite different. For this child the scope and meaning of the task were confined primarily to his knob rather than to the events taking place on the screen, and the following conditions were in effect:

1. He was not given orientation to the task as a whole which would enable him to understand the nature of the activity and his contribution to it, and he lacked a goal to impart meaning to each individual response.
2. In the absence of a goal explaining the structural restrictions of the task (taking turns, acting only on orders from the mother), any gratification to be derived from manipulation of the materials would be quickly negated by those restrictions. When this occurred, the child's motivation

depended solely on external sources of reinforcement.

3. The corrective feedback he received after each initial response applied only to the particular line he was making and did not transfer to others.
4. Consequently, despite continued repetition of motor responses, each new response was essentially a guess. The child had no way to tell ahead of time how to respond, and even after responding he could not predict his mother's reaction.
5. Nevertheless, his responses were being reinforced, and negation and criticism were more frequent and intense than affirmation and praise.
6. Because of the interaction of these factors, the child was in a position in which he was being forced to produce responses which (a) from his point of view were not related to any visible goal, (b) were not rewarding in themselves, (c) did not bring corrective feedback which would enable him to predict and control reinforcement, and (d) resulted in reinforcement which was primarily aversive.

Although the situation was somewhat more complex, these conditions would also hold for the block sorting task in cases where the mother requested block placement without first teaching the relevant attributes and the sorting principle. The major difference was that in the block sorting task, a child who developed his own system for block placement could achieve some control over reinforcement (spurious success). Even when this occurred, however, the responses were not meaningful in themselves and the children tended to be primarily concerned with reinforcement contingencies rather than with learning.

An adaptive reaction for the child under the circumstances stated above is to stop producing responses and leave the field. Many of the children in the study tried to do this, but the mothers would not allow it, so that exposure to the situation continued and new methods of adaptation were required. The parallel between the conditions outlined above and the experimental design used by Maier (1949) to produce frustration in controlled laboratory studies with sub-human species is strikingly consistent. Although the two situations are radically different and comparisons between animal data and those taken from human subjects must be viewed with extreme caution, interesting analogies may be drawn comparing the behavior of some of the children in this study with that reported in Maier's data.

The major reactions Maier reported in his animals were: (a) showing signs of agitation and attempting to avoid responding altogether (analogous to response inhibition), (b) giving up all attempts at systematic goal striving and responding fatalistically or randomly (analogous to the random type of non-meaningful placement), (c) fixating on a partially successful level of response which perseverated even when more successful methods were available (analogous to spuriously successful placement and to the systematic type of non-meaningful placement).

Although inferences concerning maternal communication and its effects on children are drawn from the data of the mother-child interactions specifically designed for this research, they appear to have relevance for any adult-child interaction situation in which performance demands are imposed on the child. The interaction data imply that in order to communicate successfully the mother must place her performance demands within a meaningful context which includes specification of the means by which goals are to be achieved in addition to specification of the goals themselves, and which allows the child to be able to see the individual steps and sub-goals as an interrelated sequence of events leading to the ultimate goal. If she fails to do so, she runs the risk that her child may perceive the demands as meaningless, arbitrary, and punitive.

Although her intentions may be quite the opposite, a mother may unwittingly structure the situation so that the child not only fails to learn the intended lesson or skill, but also acquires undesirable attitudes or habits in the process. In achievement and mastery situations, for example, exposure to such experiences can cause the child to develop negative attitudes characterized by expectation of failure and by reliance upon punishment-avoidance coping techniques rather than upon active attempts to understand ~~the~~ material being presented. In discipline and control situations, imposition of demands without adequate specification of rationales may cause the child to become responsive only to power and status differences, external sources of reinforcement, and immediate goals, rather than developing internalized self-guidance based on application of a complex system of perceptions, standards, values, and goals to individual situations.

Although all of the child behavior problems discussed above are undesirable, they differ somewhat among themselves in their implications for the child's development in the school situation. We refer in particular to the differences between resistance, inattention, and inhibition, on the one hand, and behaviors such as non-meaningful placement and spuriously successful placement on the other. Although the former types of behavior are more extreme in some ways and are certainly more obvious, they may not always be more detrimental to the child over the long run. One reason for this lies in their obviousness. Children who are regularly inattentive, resistant, or inhibited will come to the attention of their teachers as children with particular difficulties in adjusting to school and will be noted as needing individual attention. Children who show the second kind of behavior are less easily noticed, since the problem is not one of refusal or inability to respond but instead is a maladaptive style of responding.

Similar distinctions were made recently by Glick (1968), who distinguishes between process (method of formulating a response) and achievement (the response itself) in the performance of children on cognitive tasks, and notes that a given achievement can sometimes be obtained through any one of several processes. The process may be developmentally more primitive or more advanced, and when this is the case it may be more important to get the child to use the more sophisticated process than to teach him to produce the response. Glick warns that over-emphasis on achievement of the response may cause the child to persist with a more primitive but temporarily successful process and actually hinder his progress toward higher processes. The data from the children coded for spuriously successful placement in this research provide a good example of the problem to which Glick refers. Appearance of this behavior in the children was closely associated with maternal teaching characterized by poor orientation and especially by lack of specificity in pre-response instructions (Brophy, 1967), and it is precisely these aspects of maternal teaching that define the response process for the child.

The development of coping styles analogous to spuriously successful placement (going through the motions of workbook exercises without involvement, copying of homework and test answers, and in general any behavior which allows the child to give the appearance of cooperation or learning when it in fact does not exist) may have particularly unfortunate implications for the long run because of its short run success. In contrast to the resisting or inhibited child, the child who indulges in this behavior can lose himself in the anonymity of a large classroom. By creating an illusion of conformity and adjustment the child can minmize his salience as an individual and perhaps even give the impression of being a well-adapted if limited student. However, as is the case with adult avoidance and phobic mechanisms, the child can easily be trapped in a vicious circle. That is, the more he depends on such coping mechanisms for their short run success, the less he will use more adaptive response processes and the more he will fall behind in his school achievement. At the same time, continued failure to achieve will lead to increasing and more complete dependence on the mechanisms. If classroom conditions are such that this process is allowed to flourish, it may become difficult if not impossible to eliminate.

An additional problem with this behavior is its potential for creating false and undesirable expectations in the teacher. The resistive or inhibited child is likely to be categorized as an underachiever by teachers, who would expect increased self-control and cooperation in the former and enhanced self-confidence in the latter to lead to improved performance. With the child who copes through avoidance mechanisms, however, there is a real danger that the teacher may come to believe that his achievement is commensurate with his potential, seeing him as a child of limited ability from whom little is to be expected. Should this occur, of course, it would reinforce the usefulness of the coping mechanism for the child, thereby adding to the spiral of undesirable effects and increasing their grip upon him. It will also reduce the likelihood of change, since teachers' expectations concerning their students are known to affect both their interaction with the students and the levels of achievement which the students attain (Clark, 1966).

Children who habitually respond to classroom demands in ways which favor short run success at the expense of development of higher response processes probably do not occur as frequently or present problems as immediate and obvious as those characterized by resistive acting out or passive inhibition. However, they are most likely to be found in the same crowded and disorganized classrooms where the latter types of children are of major concern to educators, and their presence should not be overlooked.

CHAPTER VI

COGNITIVE BEHAVIOR OF MOTHER AND CHILD

The general problem to which this project addressed itself was understanding how cultural experience is translated into cognitive behavior and potential for academic achievement. This question developed out of a concern for understanding what is meant by cultural deprivation or cultural disadvantage. There has been considerable documentation of the depressing effect of social and cultural disadvantage upon academic ability (Deutsch & Brown, 1964; Eells et al., 1951; Gray & Klaus, 1965; Karp & Sigel, 1965; Kennedy et al., 1963). The more basic problem, however, is to understand the mechanisms that mediate between the individual and his environment. In the previous chapters we have attempted to conceptualize social class as a discrete array of experiences and patterns of experience that can be examined in relation to the effects they have upon the emerging cognitive functioning of the young child.

One focus of our research has been the linguistic environment and communication patterns between mother and child; in agreement with Vygotsky (1962) and Luria (1959), we believe that level of language development is a function of the linguistic environment in which the child develops and that cognitive development is to a considerable degree dependent upon language development. However, the significance of the linguistic environment lies not only in the amount of verbal exchange but in the structure of the interaction between learner and teacher. When discussing maternal teaching styles we have found it useful to draw upon the work of Basil Bernstein at the University of London involving concepts concerning communicative modes (elaborated or restricted; that is, precise and individualized, or stereotyped and condensed), and family control systems (oriented to status, person, or rational consequences; that is, whether the child's behavior is regulated by ascribed role norms or whether the unique characteristics of the situation modify such demands; an emphasis is put on obedience, on empathy, or on logical, rational behaviors). Such concepts have proven efficacious in predicting whether a child will take an assertive-exploratory or a passive-compliant approach to his environment and whether reflective or impulsive behaviors will occur in a problem-solving situation (see Chapters IV and V).

In the previous chapters we have presented various findings from our study of the cognitive environments of urban preschool children--findings that we believe are indicative of the differences in preschool socialization which have consequences for cognitive growth and educability. The present chapter is concerned with the intellectual resources of the mother and the status of her four-year-old's cognitive development. We have chosen to focus on the child's ability to categorize--one of the most commonly used ways to study cognitive development--since it assesses the important ability to use language as a cognitive tool. In this chapter we will look at the four-year-old's ability to make verbal classifications, his ability to give labels and to discriminate and choose relevant properties of objects; and observe how this is related to his social status and sex and to his mother's preferred mode of categorization and general teaching style.

Intelligence Test Performance

There has been considerable controversy in recent years over the repeated findings of differences in IQ performance between middle-class and working-class and between white and non-white samples. Research is being aimed increasingly at understanding such differences, at delineating the environmental antecedents and characteristics of the testing situation which lead or do not lead to successful performance. Because of the inadequacy of tests for measuring functional intelligence, problem-solving capacities, and creative potential, particularly at lower-class levels, the project staff have tended to regard such tests as measures of general achievement of school-relevant learning. They measure the acquisition of facts as well as test-taking skills which are predictive of success in our present school systems, not a vague "intelligence" or ceiling level of learning ability. Jensen (1966) has recently suggested that the equivalence of performance of lower-status children with middle-status children on laboratory-learning tasks, such as selective trial and error learning and paired associate learning which do not require transfer from previous learning, suggests that learning ability of children from lower-status backgrounds is not adequately reflected in general intelligence tests. But the rate of acquisition of the cognitive skills measured by standard IQ tests is a function of the basic learning abilities and the opportunities afforded by the environment. This orientation is consistent with Hunt's view (1961) that intelligence is a function which develops in and through interaction with the environment.

All our tests were given by experienced female examiners and were individually administered. This enabled us to be more alert to the test-taking situation and to maximize opportunities for obtaining good rapport and for reducing any test anxieties present. Cognizant of the young child's greater susceptibility to situational variables in testing situations (cf. Sattler & Theye, 1967), we allotted at least 2½ hours per testing session to allow time for the young child, especially a lower-class child unfamiliar with visiting new places, to become familiarized with the testing rooms and staff. This also was done to counteract the reported decrement in performance by Negro children when speed is demanded (Anastasi, 1961; Levinson, 1963). Mother and child initially met together and stayed together until the child seemed ready; then the child accompanied the tester to an adjacent room from which he could visit his mother easily.

Since the mother's verbal ability is a crucial factor in teaching the child the verbal skills which equip him to make use of classroom learning situations, we chose the Vocabulary, Similarities, and Comprehension subtests of the Wechsler Adult Intelligence Scale (WAIS). The Information and Arithmetic subtests were also given to indicate the mother's degree of school learning and the extent to which she had retained what she had learned. Except for the Arithmetic subtest, the scoring for all these subtests allows differentiation of quality (such as abstract vs. concrete) as well as correctness of response. Because groups were considerably greater than between groups (see the figures in Appendix M). To an extent this finding reflected a selection bias because any child with observable, marked physical or intellectual impairment was disqualified as a subject at the initial home visit, although the occurrence of such handicaps is reportedly more frequent in lower-class groups (Pasamanick & Knobloch, 1958). We eliminated the handicapped since we were interested in children likely to attend regular school classes. The small between-group differences probably also resulted in part from the fact that the Binet preschool tasks do not require much verbal behavior, and because care was taken in test administration to establish rapport and reduce external pressure. These results, however, are consistent with recently reported performance on the Stanford-Binet by four-year-old Negro Chicago youngsters in Head Start (Hess _et al_., 1966; Shipman, 1967). Nevertheless, on the basis of previous research (Bloom, 1964; Cooper, 1964; Deutsch & Brown, 1964; Kennedy _et al_., 1963; Osborne, 1960), these differences may be expected to increase as the children become older, as the tests become increasingly verbal, and as the differences in cognitive environments take their toll. Differences within each group by sex were not significant, except for the middle-class group where girls scored significantly higher than boys (mean IQ = 112.6 and 106.2, respectively).

Although the mean IQs obtained for the children on the Binet and CMMS were very similar (a maximum mean group difference of three IQ points), the correlation between individual performance on the two tests was only .52. The correlation decreased with social status level (.60, .40, .18, and .30, respectively). Related to this finding was the fact that the range of scores on the CMMS was more restricted. Moreover, in many cases the CMMS IQ proved invalid since the test does not have a low enough basal level; the resulting MA obtained with chance performance was spuriously high for a child with CA of only 3-9 to 4-4. The way the test was constructed, if the child by chance made one correct response, he was assigned a mental age of 3-1. (This was reflected in the obtained significant negative correlation with age and for the total group (r = -.20); and for the three working-class groups (with skilled, r = -.31; with unskilled, father present, r = -.56, and with father absent, r = -.29).

The difference in the magnitude of the correlations for different status levels probably also reflects the fact that the Binet is not an invariant test; the nature of the task changes with age level. A greater percentage of working-class subjects were tested on the two- to four-year-old age-graded items which include more tests of motor coordination, memory, etc. than were middle-class subjects, the majority of whom tested within the three- to six-year-old age-graded range with its increased frequency of verbal items. The fact that the correlation between the CMMS and Stanford-Binet was higher for subjects tested in the more verbal range of the Binet suggests the more verbal component of the CMMS in the preschool years. As was manifest to the examiners, pointing did not help a child who did not know the meaning of "same" or "different" and/or who was unable to follow directions.

These data agree with the findings of Deutsch (1965) and John (1965) that deficiencies based on social class are revealed in measures which reflect abstract and categorical use of language as opposed to denotative and labeling usage. Such behavior was strikingly evidenced in our study with the Sigel Sorting Task and in the interaction more data were being collected on the mothers, leading to less available testing time per task, and the focus of the study was on the linguistic environment, only (WAIS) Verbal IQs were obtained.

The children, however, were given the Columbia Mental Maturity Scale (CMMS) in addition to the Stanford-Binet, Form LM. These tests were chosen because of the abundance of material available on them and because studies have failed to show that disadvantaged children do better on special tests than on more conventional intelligence tests (Karp & Sigel, 1965). As Karp and Sigel have pointed out, attempts to reduce and eliminate cultural bias in test items and to apply the tests thus constructed to different groups have brought conflicting and confusing results. The approach of test constructors in this regard has been to minimize verbal items and to emphasize items requiring other perceptual and motor functions. However, since interests, work habits, and problem-solving attitudes originate largely from cultural conditioning and influence the development of special abilities, we can not assume that nonverbal tests more nearly approach culture-fairness. Levinson (1963) indicated that for entirely different reasons Jewish and American Negro children have been seen to function more poorly on performance tests than on verbal tests. Whereas verbal learning is stressed in the former culture, the Negro has been described as having a more passive approach to problem-solving which impedes his performance when speed is demanded. Anastasi (1961) also explained the poorer performance of American Negro children on perceptual and spatial tasks on the basis of speed.

The IQs obtained with the measures used in this study are reported in Table VI-1.

TABLE VI-1

Social Status Differences in Mean
IQs of Mother and Children

Social Status Level	Intelligence Test Measures					
	WAIS (Verbal)		Stanford-Binet (Form LM)		Columbia Mental Maturity Scale	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Middle Class	109.4	11.20	109.4	14.98	109.9	14.58
Working Class:						
Skilled	91.8	13.85	98.6	14.52	101.8	16.04
Unskilled:						
Father Present	82.5	13.58	96.3	10.42	97.8	8.49
Father Absent	82.4	13.61	94.5	9.72	97.9	5.85

For the mothers there was a highly significant difference in mean IQ between the three status levels, but the mean IQs for the children's groups were fairly close, and all were within the average range. The only significant differences in Binet IQ were those between the middle and each of the three working-class groups. Differences within social sessions where the child was required to sort objects and give a rationale for his sorting; these data are discussed later in the chapter.

As stated earlier, the focus of this research was not on corroborating social class differences in intelligence test performance, but on understanding the antecedent conditions affecting such performance. It is not sufficient to explain such differences by reporting our obtained correlation of -.41 between social status level and Binet IQ or .49 between the mothers' WAIS Verbal IQ and their children's Binet IQ. Instead, we wish to determine the predictive power of certain maternal behaviors and to be more specific about the behaviors encompassed by a global measure like IQ. Multiple R's using as predictors the major maternal variables stressed in this study did as well or better than IQ or social class in predicting the child's cognitive behavior. In preliminary analysis it was found that although an analysis of variance yielded a significant between group (social status) F for Binet IQ, this significant F disappeared with an analysis of covariance design which controlled for differences in mothers' communicative styles (e.g., person-vs. status-orientation, giving of rationales for behaving in school, more elaborated linguistic codes and feelings of futility in dealing with the school).

When we did a multiple regression employing the major teaching factors and control behaviors discussed in the previous chapters and then correlated WAIS IQ with the residual variance, we were able to significantly increase our power to predict the child's intelligence test performance. This was not the case with social class level.

In analyzing the interview data, differentiations within the working-class groups which yielded significant differences in the child's intelligence test performance included the mother's statement that he had been read to yesterday ($p < .005$) and a ratio of less than 2.1 children to each adult in the home ($p < .025$), items likely to be closely associated. Moreover, those lower-status mothers who lived in Chicago more than seven years and engaged in several group activities outside the home had children whose mean IQ was significantly higher. Similarly, Dave (1963) and Wolf (1964) found parental behavior rather than status to be the more powerful determiner of academic and intelligence test performance. In our attempts to determine more exact indicators of the home environment than sociological characteristics such as father's occupation, parents' education, and type of dwelling, we hope to be better able to explain why, within homes of the same social status, there is so much variation in certain behavioral characteristics among children, and why there are so many notable exceptions to the "low status-low achievement" maxim.

Cognitive Styles

Twenty Questions

Recent interest in assessing styles and modes of thought processes has produced new tasks such as the "Twenty Questions" procedure developed by Bruner and his associates at the Harvard Center for Cognitive Studies (Mosher, 1963). Given the problem, "It was Friday afternoon and Mr. Jones' car ran off the road," and instructed to ask up to twenty questions answerable by "yes" or "no" in order to establish what

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happened, the subject may adopt several alternative strategies. He may ask constraining questions ("conservative focusing") which successively narrow the possibilities open, or make guesses ("successive or hypothesis-scanning"), involving less effort, but which leave nearly as many possibilities open as before. He may ask general questions which establish constraints on the answer or he may concentrate from the beginning on specific solutions.

A study of the mother's responses indicated her strategies in the acquisition and use of information in solving this problem. A rough list was made of all the questions actually asked by the mothers in the sample, and these were sorted into a limited number of domains and then arranged in a more or less hierarchical fashion within domains. The relative ranks of two questions in the hierarchy were based either on logical inclusion of one by the other or on an estimate of the relative number of specific possibilities they included. Guesses were defined as those responses having no apparent relationship to questions which preceded or followed and which were at the specific level in their domain. We also noted those questions the mothers asked which would be unnecessary if information gained earlier were being fully used and those questions which sought information irrelevant to the cause of the event.

Among the measures of strategy, the one which is closest to the hypothesis scanning-constraint seeking dimension is the proportion of the mother's questions which are guesses. This measure contrasts the questions which are specific and are unrelated to or unconstrained by any other questions with the remainder of questions which are either higher level attempts at establishing some constraint, and which may or may not themselves be constrained, or are specific questions which follow in some way from information already established. Percent Guess measures the proportion of a mother's performance which shows no indication of constraint or connectivity. A mother high on this measure approximates the "ideal hypothesis scanner." Percentages were utilized to partial out the variation due to total number of questions and to eliminate the chances of spurious correlations based on it.

TABLE VI-2

Comparisons in Mean Percent Use of Constraining and Guessing Responses by Social Status (20 Questions Protocols)

Social Status Level	N	Type of Response Constraining	Guessing
Middle Class	39	39.6	64.1
Working Class:			
Skilled	33	29.4	60.6
Unskilled:			
Father Present	39	30.3	69.6
Father Absent	38	31.0	68.9

Analysis of the approaches used by the mothers in this study supports the idea that individuals differ along the hypothesized dimension from constraint-seeking to hypothesis-scanning and that this dimension refers both to the level at which information is sought and the way it is exploited once obtained. Table VI-2 reveals a tendency for the middle-class mothers to use more constraining questions, but the differences are small and there is considerable overlap between groups. It should be noted, however, that the use of constraining questions is not necessarily equated with quicker solution. Although constraint seeking improves one's chances of obtaining information that can be followed up, luck and variations in individual experience and capacity for exploiting such information may account for as much variance in solving the problem as choice of strategy. Moreover, in a simple task such as ours, guessing may be equally or more successful. This may account for its greater use by all groups. Mosher's findings (1963), however, suggest that if we had used more problems, the percentage of "guess" questions would have decreased. This would seem to indicate that an additional reason for the greater use of guesses is that people in general are inefficient in solving this type of problem. With practice, however, they discover this inefficiency and attempt alternative methods.

We found that the mother who predominantly used constraining questions was also more likely to program her teaching in a more efficient manner. The limited sampling of such behavior makes any conclusions highly tentative, but percent use of constraining questions was significantly correlated with sequencing information (Block Sorting, Orientation Factor: $\underline{r} = .16$, $p < .05$), being sensitive to feedback (Block Sorting, Feedback Factor: $\underline{r} = .19$, $p < .05$), and relying on rationales involving appeals to personal intents and feelings (Mastery-Person: $\underline{r} = .17$, $p < .05$). Moreover, this task provides data concerning the mother's frustration tolerance (e.g., whether she gave up prior to solution) and her tendency to use vague and irrelevant responses. Mosher found a low but significant negative correlation between the individual's percent use of guesses and his ability to delay immediate gratification.

Sigel Conceptual Style Sorting Task

During his second testing session at the University, each child was administered the Sigel Conceptual Style Sorting Task. On each of twenty trials the child was asked to pick one of three pictures to go with the test picture. Instructions were as follows: "Here is a picture (*E* points to the standard) and here are three more pictures." (*E* points to the array of three items.) "Pick out from these three *one* picture that goes with, or is like this one in any way and put it with this one." (*E* points to appropriate pictures while giving directions.) For five of the trials ambiguous deawings of human figures were used; the remainder were black and white photographs depicting familiar characters, animals, or objects. After pointing to one of the pictures, the child was asked to explain his choice, and the experimenter recorded it verbatim. Rationales were classified as *descriptive* (having direct reference to manifest stimulus attributes, a distinction being made between *descriptive-global* and *descriptive part-whole* responses which use all or part of the stimulus, respectively), e.g., "men," "nurses," "have guns," "have shoes"; *relational-contextual* (stimuli have functional or thematic interdependence), e.g., "mother and baby," "the men are fighting"; and *categorical-inferential* (stimuli are independent representatives of a class based on inferred or non-observable characteristics), e.g., "we eat them," "they go in the water." In addition, nonscorable responses were classified as *nonscorable verbal* (e.g., "looks like it" or disjunctive responses, such as "this is a truck and this is a horse"), *nonverbal* (child points, edges cards, or only says "don't know"), or *nonsort* (where no choice is made).

Each mother was given the adult version of the Conceptual Style Sorting Task which required her to make twelve sorts from a random arrangement of Make-A-Picture Story (MAPS) figures. She could use as many figures as she wished in a group, and could re-use figures if she gave a different rationale for her grouping. Rationales for the sorts were scored according to the same categories described above.

The most striking finding for the children's performance on the Sigel Sorting Task is shown in Figure VI-1, the comparison in percent scorable responses by social class. As social status decreased, percent scorable responses decreased, from 51.2 percent to 15.1 percent. Tables VI-3 and VI-4 show that in virtually all categories (the exception being one small reversal between the two unskilled working-class groups for the descriptive part-whole category), the mean score for each of the cognitive style dimensions decreased, while nonscorable responses increased, with decreasing social class level. These differences are greater than would be expected on the basis of the mean IQ scores for the groups (109.4, 98.6, 96.3, and 94.5, respectively).

TABLE VI-3

Mean Scores for Cognitive Style Dimensions
by Social Status

	Social Status Level			
		Working Class		
Category	Middle Class	Skilled	Unskilled	
			Father Present	Father Absent
Total Descriptive	5.0	3.0	1.7	1.3
Descriptive Part-Whole	2.2	0.6	0.2	0.3
Descriptive-Global	2.8	2.3	1.5	1.0
Relational-Contextual	3.2	2.2	1.2	1.0
Categorical-Inferential	2.0	1.4	1.2	0.6

Since there is considerable variability among our groups, and mean scores may reflect the contributions of a small number of children, Tables VI-5 and VI-6 indicate the volume of responses within each category, that is, the mean percent use of a particular category as well as the number of children able to respond and use a particular category. It can be seen that the differences obtained in mean scores in Tables VI-3 and VI-4 provided consistent results with these methods of analysis. Children from lower-class homes did poorer on a cognitive sorting task

Figure VI-1

Comparison of Percent of Scorable Responses by Four-Year-Olds on the Sigel Sorting Task

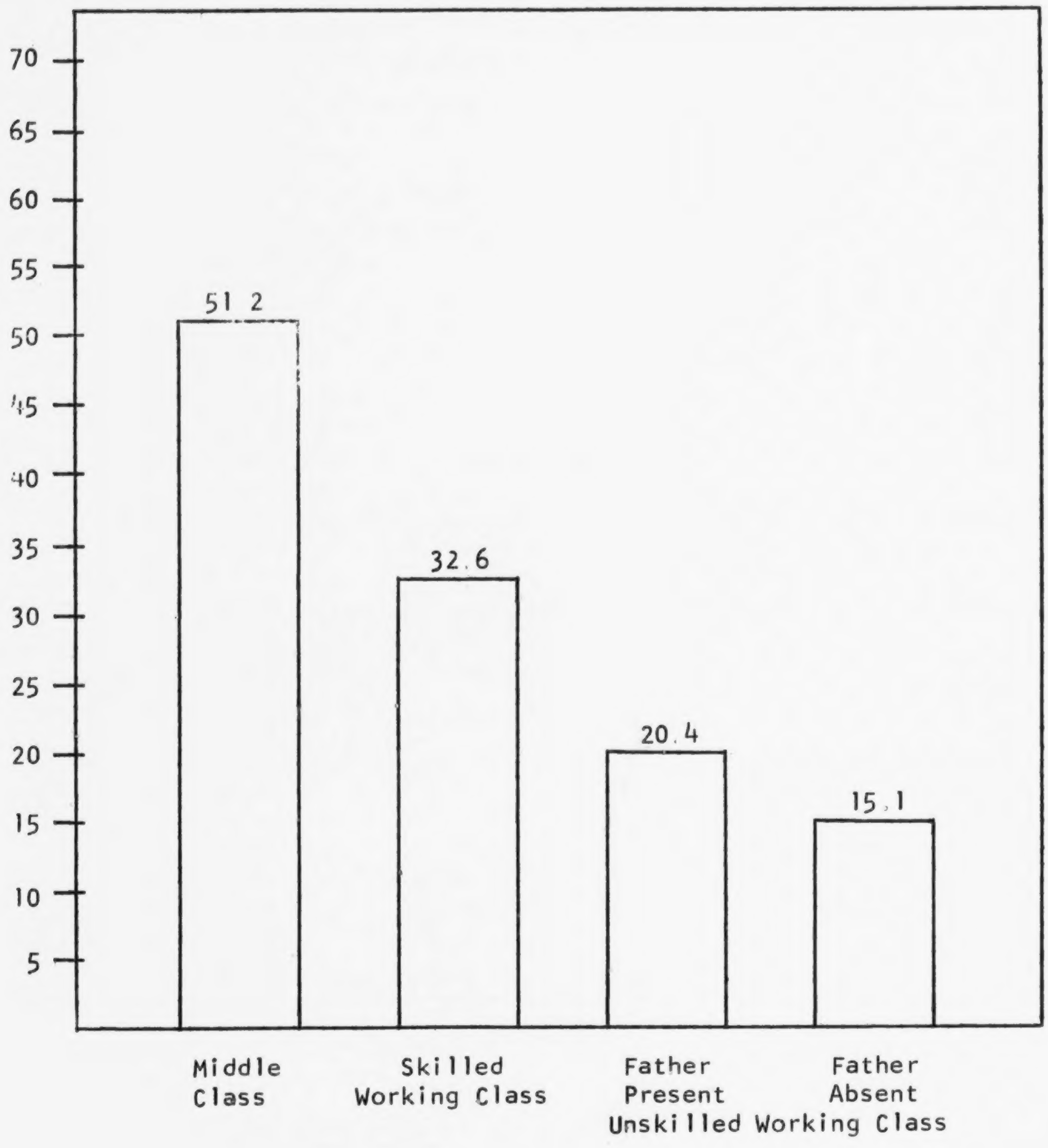

TABLE VI-4

Mean Scores for Nonscorable Responses on the Sigel Sorting Task by Social Status

Category	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Nonscorable Verbal	5.8	6.1	6.6	7.2
Nonverbal	3.0	6.7	7.1	8.8
Nonsort	1.0	0.6	2.2	1.0

TABLE VI-5

Social Status Differences in Percentage of Sorting Categories by Four-Year-Old Children

Category	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Descriptive Part-Whole	11.2	3.2	1.0	1.7
Descriptive-Global	14.0	11.5	7.6	4.9
Relational-Contextual	15.9	11.1	5.9	5.1
Categorical-Inferential	10.1	6.8	5.9	3.0
Nonscorable Verbal	28.8	30.5	33.2	36.2
Nonverbal	15.0	33.6	35.4	43.8
Nonsort	5.0	3.2	11.0	5.2

TABLE VI-6

Percentage of Four-Year-Old Children Responding
in Each of the Sorting Categories

Category	Social Status			
		Working Class		
			Unskilled	
	Middle Class	Skilled	Father Present	Father Absent
Descriptive Part-Whole	40.0	25.0	18.0	14.6
Descriptive-Global	70.0	55.0	53.8	31.7
Total Descriptive	80.0	65.0	59.0	39.0
Relational-Contextual	77.5	65.0	41.0	43.9
Categorical-Inferential	52.5	42.5	30.8	24.4
Nonscorable Verbal	85.0	87.5	92.3	85.4
Nonverbal	52.5	70.0	82.0	87.8
Nonsort	12.5	7.5	25.6	19.5

requiring verbal classifications. The result of the decreased linguistic interaction between parents and children observed in working-class homes and the restricted language styles employed, as reported by Bernstein (1964) and in Chapter VII of this report, is that these children appear hindered in the discrimination and labeling processes required for classifying. Although a knowledge of naming does not predict the classificatory behavior used, words encourage us to think in terms of categories and help us isolate relevant properties of objects and experiences.

Table VI-6 presents the percent of children responding at least once in each of the categories. Although most upper-middle-class children and a majority of the skilled-working-class children used relational and descriptive-global responses, there was no extensive use of any of the cognitive style dimensions by the two unskilled working-class groups. In looking at particular categories, one may note the relative absence of descriptive part-whole responses for other than the middle-class group and the large rise in nonverbal responses below the middle-class level.

Obviously, not all children used every label, although some consistent preferences are apparent across groups. Order of preference for the cognitive style dimensions was relational and descriptive-global alternating for first and second places in each of the groups, followed by categorical-inferential and descriptive part-whole. Relational and descriptive-global responses have been considered the most immature and would be hypothesized to occur most frequently in preschool children. The child's classifying behavior has been described as moving from idiosyncratic and irrelevant cues to a concrete mode and then to the abstract. Relational responses are often subjective, and since they are found to correlate with impulsivity (Kagan et al., 1964; Sigel et al., 1967), they have been considered more primitive. Descriptive-global responses, often referring to sex and occupational roles (men, nurses), are somewhat more dependent upon experiences. On the other hand, descriptive part-whole responses have been shown to increase with age and would be expected to be used less frequently. It may be recalled that this category, which has been correlated with favorable prognostic signs for educability such as attentiveness, control, learning ability, and most recently with prediction of first grade reading ability (Kagan, 1965), was used essentially only by the middle-class children. Kagan (1964) has described two fundamental cognitive dispositions involved in producing such analytic concepts: the tendency to reflect over alternative solutions that are simultaneously available and the tendency to analyze a visual stimulus into component parts. Both behaviors require a delayed discrimination response. One may describe the impairment noted in culturally disadvantaged children as arising from differences in opportunities for developing these reflective attitudes.

Kagan, Moss, and Sigel (1963) and Sigel (1963, 1965) have reported sex differences in the utilization of these categories; Table VI-7 presents the mean scores for boys and girls within each of our social class groups. For the cognitive style dimensions, comparisons by sex seems to indicate no discernible pattern within categories or social status level, and the small mean scores would make any hypothesis suspect. It may be noted, however, that in contrast to the findings reported for white middle-class four- and five-year-olds, where boys gave predominantly more descriptive part-whole responses, in our sample middle-class girls used this category more. In Sigel's more recent studies (1967) with urban Negro children he reports this same sex difference, with girls giving more descriptive part-whole responses. Since Kagan in various papers (1963, 1964) and Sigel et al. (1963) have reported on the positive relationship between descriptive part-whole responses and reflective, independent, emotionally controlled, masculine behavior in boys, our findings may reflect racial differences in sex-role expectations.

In looking at the remaining categories, however, a consistent sex-related trend appears. Girls gave more nonscorable verbal responses, while boys gave more nonverbal ones. Girls were more likely to have tried to use words, though in certain instances not differentiated enough for classification (e.g., "because it has this and this;" "because it looks like it," with no further response following additional probes), while boys said "I don't know" or resorted to pointing or moving the pictures together. It can be hypothesized that boys, especially in lower-class urban Negro homes where the adult male may play a negatively-valued role, receive more negative reinforcement for verbal behavior and that girls are encouraged to talk more and are talked to more. As a consequence, when unsure of himself, the boy is less likely to experiment with words. We found in the open-ended questions that mothers of girls tended to use more elaborated, differentiated linguistic styles and were more likely to give their children rationales for behaving. Consequently, boys, receiving more restricted codes, would have been hypothesized to be more impaired in their ability to offer verbal rationales for sorting.

Let us now look at the mother's performance on the Sorting Task. In analyzing the mothers' preferred manner of grouping stimuli and the level of abstraction they used in perceiving and ordering objects in

TABLE VI-7

Mean Sorting Scores by Sex

Category	Social Status							
	Middle Class		Working Class					
			Skilled		Unskilled			
					Father Present		Father Absent	
	Boys (N=20)	Girls (N=20)	Boys (N=20)	Girls (N=20)	Boys (N=20)	Girls (N=19)	Boys (N=20)	Girls (N=21)
Descriptive Part-Whole	1.3	3.2	0.9	0.4	0.4	0.0	0.2	0.5
Descriptive-Global	2.3	3.3	2.5	2.1	1.1	2.0	1.2	0.8
Total Descriptive	3.6	6.5	3.4	2.5	1.4	2.0	1.4	1.3
Relational-Contextual	3.1	3.2	2.1	2.4	1.8	0.5	1.0	1.1
Categorical-Inferential	2.4	1.6	1.2	1.6	1.4	1.0	0.2	1.0
Nonscorable Verbal	4.6	7.0	5.2	7.0	5.8	7.5	6.4	8.0
Nonverbal	4.6	1.4	6.8	6.6	7.9	6.2	9.8	7.8
Nonsort	1.7	0.3	1.3	0.0	1.6	2.8	1.3	0.8

their environment, it may be seen in Table VI-8 that relational-contextual responses were most frequently offered; categorical-inferential were the next most common, and descriptive most infrequent. The distribution of responses in our status groups showed that the middle-class group was the higher on descriptive and categorical categories; low status groups were higher on relational ones.

TABLE VI-8

Mean Responses to Adult Sigel Sorting Task (MAPS)
by Social Status

Category	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Total Descriptive	3.2	2.2	2.1	2.6
Descriptive Part-Whole	1.6	1.3	1.3	1.5
Descriptive Global	1.5	0.9	0.8	1.1
Relational-Contextual	5.5	6.8	7.5	6.7
Categorical-Inferential	3.3	3.0	2.2	2.7

The greater use of relational categories by working-class mothers is especially significant. Response times for relational sorts are usually shorter, indicating less reflection and evaluation of alternative hypotheses. Such responses also indicate relatively low attention to stimulus details (Kagan et al., 1964). Many relational responses were very subjective, reflecting a tendency to relate objects to personal concerns in contrast with the descriptive and categorical responses which tended to be objective and detached, more general and more abstract. Categorical responses, in particular, usually represented thought processes which are more orderly and complex in organizing stimuli, suggesting more efficient strategies of information processing.

These interpretations become more striking when one looks at the relationships between these categorizing behaviors. Among the scoring dimensions for the mother, descriptive-global and categorical responses, both of which entail categorizing and labeling, were significantly positively correlated (Pearson r = .26). But descriptive part-whole and descriptive-global responses were both negatively related to the use of relational categories (Pearson r = -.61 and -.68, respectively). This pattern was also seen in the way they correlated with WAIS Verbal IQs, reflecting the greater use of intellective factors in descriptive and categorical responses. (For the children there were no significant correlations between scoring dimensions, except of course between descriptive-total and its parts.) Therefore, as social status decreased, we saw decreased use by the mothers in this study of an abstract attitude toward a task and from this we would predict resulting detrimental effects on the child's ability to develop more abstract modes of thinking.

The small number of scorable responses for the children make statistical comparisons difficult, but certain trends were clearly evidenced. The mother's use of a predominant mode of relational categorizing was significantly related to the child's use of nonscorable and nonverbal responses on the Sigel. Moreover, it significantly contributed (negatively) to a multiple R with the child's IQ and was related to poor performance on the block sorting and Etch-a-Sketch tasks. The mother's inability or disinclination to take an abstract attitude on the sorting task was correlated with ineffectual teaching on the block sorting task and inability to plan and control the Etch-a-Sketch situation. Since relational responses have been found to be correlated with impulsivity (Kagan, Moss, & Sigel, 1963), tendencies for nonverbal rather than verbal teaching, mother domination in the interaction setting and limited sequencing and discrimination might be expected and would be predicted to result in limited categorizing ability and impaired verbal skills in the child. Significantly, there was a trend for maternal relational responses to be associated with inability or refusal of the child to make a sort. It might be noted here that maternal relational responses were negatively associated with the child's use of relational responses. For the four-year-old, use of relational responses indicated the child's success in providing a rationale, though a simple one. As he matures and the frequency of relational rationales decreases as other categories appear, we would expect a positive correlation between maternal and child usage of relational categories.

Analysis of our other measures of cognitive interaction offers additional evidence of the relationship between maternal communication modes and the child's categorizing ability. We have factor analyzed the mother's teaching behaviors during the block sorting situation and found that the child's use of descriptive part-whole or analytic responses is negatively associated with what we describe as a "tug of war" factor (a non-attending child with an increasingly impelling mother), but positively associated with a factor which is indicative of good verbal interaction (the mother asks the child for verbal responses and gives verbal feedback, and the child gives verbal replies and spontaneously verbalizes). Since the number of children's scorable responses was limited, we combined them in order to perform a regression analysis. Significant partials were obtained both for the total sample and for the working-class groups along with measures of the mother's effective teaching (orientation factor score) and elaborated language (language factor score). It may be the focusing on relevant attributes and rationales plus the language specificity reflected in these factors which serve to help the child to delineate stimulus aspects for classifying.

Similar to our findings for performance on the Stanford-Binet, significant relationships ($p \leq .05$) within the working-class sample were found between number of scorable responses on the Sigel Sorting Task and number of children in the home, ratio of children to adults and amount of reading material available and used by the child in the home. Given the opportunity for more adult-child interaction in the home, particularly in school-related tasks (i.e., reading), the child tends to be more adept at producing task-relevant responses (i.e., rationales for sorting).

In a regression analysis using the nine language scales developed to measure various dimensions of lexical, syntactic, and cognitive complexity and elaboration in the mother's speech plus social class, mother's WAIS Verbal IQ and child's Binet IQ, social class level was significantly correlated only with descriptive part-whole responses. Although marked differences by social class are reported, when other variables are controlled for it appears to be of only limited relevance as a predictor. The most striking relationship occurred between mother's language abstraction and the child's categorical-inferential responses. Since occurrence of these behaviors was essentially limited to the middle class, this correlation holds only for that group. It is of interest to note that it was not the mother's abstraction ability (as measured by WAIS Verbal IQ and especially the Similarities subtest), but her abstract behavior that was related to the child's cognitive abstraction. These data are described in greater detail in Chapter VII.

In analyzing our mothers' responses to open-ended questions in the interview concerning hypothetical school situations we found consistent negative relationships between percent of status-oriented and imperative message units (where the mother gives the child no rationale for her proscribed behaviors, but just commands) and the child's ability to categorize. This is strikingly evidenced in Figure VI-2 which compares the number of nonverbal responses given by children whose mothers are high and low in percent use of imperative responses. Using each of the child Sigel scores mentioned as dependent variables in a regression model containing the teaching factors, language styles and factor scores from the Educational Attitude Survey as independent variables, we obtained multiple correlations between .45 and .59. Again we find these maternal behaviors to be equal to or better than IQ and social class as predictors of the child's cognitive functioning, both for the total sample and for the working-class groups alone.

In contrast to its role in predicting the child's intelligence test performance, the mother's verbal IQ was not a major predictor of the child's conceptual style responses. Similarly, the child's Binet IQ, with the exception of descriptive responses, was minimally associated with the other conceptual style categories. Level of conceptualizing ability and preferred mode of categorizing in a situation where alternatives are possible are clearly different though related aspects of cognitive functioning. However, in studying those children unable or unwilling to make cognitive sorts or to give verbal rationales, such deficits were more pervasive and were also reflected in low intelligence test performance.

Measures of the Children's Learning

In the teaching situations we obtained additional measures of the child's ability to sort objects correctly and to verbalize the principle on which the sorting or grouping was made. Children from middle-class homes were well above children from working-class homes in performance on these sorting tasks, particularly in offering verbal explanations as to the basis for making the sort (Tables VI-9 and VI-10). Over 60 percent of the middle-class children placed the objects correctly on all tasks; the performance of working-class children ranged as low as 28 percent correct. Approximately 40 percent of these middle-class children who grouped successfully were able to verbalize the sorting principle; working-class children were less able to explain the sorting

Figure VI-2

Comparison of Cognitive Performance of Children
Whose Mothers are High and Low on Imperative Responses
(Mean Scores)

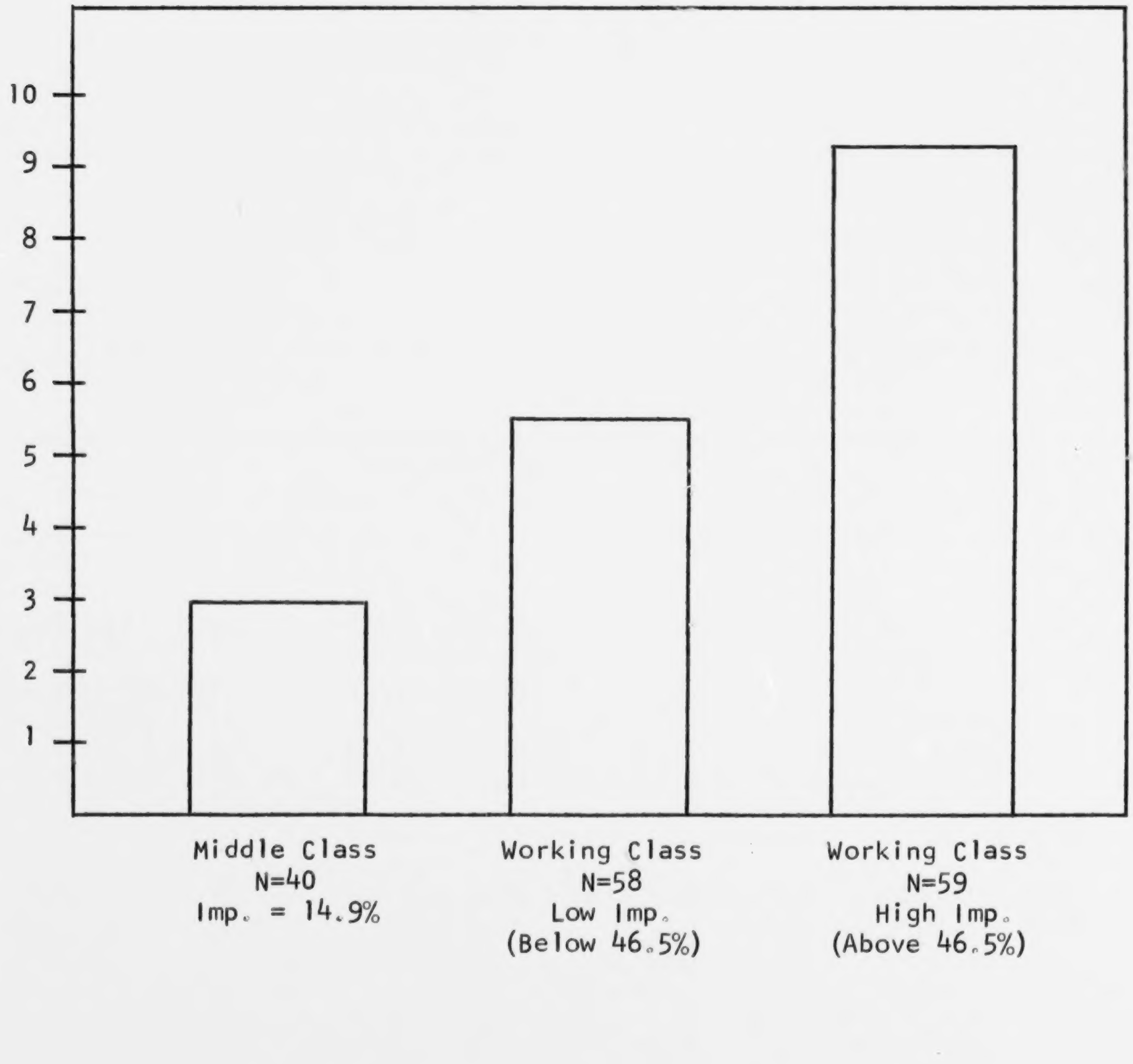

TABLE VI-9

Social Status Differences in Child's Performance on Sorting Tasks Taught by Mother

Mean Score (and standard deviation) on:	Social Status			
		Working Class		
			Unskilled	
	Middle Class	Skilled	Father Present	Father Absent
Toy Sorting (standard deviation)	2.6 (2.02)	2.2 (1.68)	2.1 (1.90)	1.9 (1.42)
Block Sorting (standard deviation)	3.2 (1.84)	2.1 (1.61)	1.8 (1.74)	1.4 (1.16)

TABLE VI-10

Differences Among Status Groups in Children's Performance in Teaching Situations (Block Sorting Task)

Social Status	Placed Correctly %	One Dimension Verbalized %		Both Verbalized %	
Short O:					
Middle Class	75.0	52.5	70.0*	25.0	33.3*
Working Class:					
Skilled	51.2	29.3	57.1	2.4	4.8
Unskilled:					
Father Present	50.0	27.5	55.0	15.0	30.0
Father Absent	41.5	19.5	47.1	2.4	5.9
Tall X:					
Middle Class	60.0	47.5	79.2	27.5	45.8*
Working Class:					
Skilled	48.8	31.7	65.0	17.1	35.0
Unskilled:					
Father Present	35.0	17.5	50.0	7.5	21.4
Father Absent	26.8	9.8	36.4	0.0	0.0

*Percent of those who placed object correctly.

principle, ranging downward from the middle-class level to one task on which no child in the father-absent unskilled group was able to verbalize correctly the basis of his sorting behavior. These differences clearly paralleled the relative abilities and teaching skills of the mothers from differing social status groups.

It may be noted that in the simpler sorting task requiring the child to sort plastic toys by color and function, the differences between the status groups increased markedly when the child was required to give a color rationale. This result reflects again the fact that differences in performance are more sharply revealed in those measures which tap abstract and categorical use of language as opposed to denotative and labeling usage.

In the teaching situations, the mothers from the four status groups differed relatively little on the average in the affective elements of their interaction with their children. The gross differences appeared in the verbal and cognitive environments which they presented --in the amount and specificity of task-relevant information, whether attempts were made to elicit feedback from the child to discover how much he understood, and the manner of reply to the child's feedback. A major variable for predicting the child's success in correctly placing and/or explaining the principle for sorting the blocks or toys in response to the examiner's request was whether the child was given many opportunities during the teaching session to talk about the task. The larger the proportion of physical commands and questions by the mother ("Put this block with the tall ones"), the poorer the child's performance. A passive learning style was negatively related to high success in the teaching situation. These data are described in detail in Chapter V and therefore will not be elaborated upon further in this chapter.

Curiosity Behavior

The concept of curiosity plays an important role in current developmental theory and educational practice. Theories of cognitive development (Piaget, 1954; Bruner, 1966; and White, 1960) hold that an intrinsic interest in environmental variation causes the child to progress from one cognitive stage to the next. In current educational practice, new methods of teaching are being developed to appeal to the child's "natural" curiosity about the world. And in terms of personality theory, White has proposed (1959, 1960) that the fate of the child's early explorations and manipulations determines his later sense of competence and initiative.

In spite of a considerable amount of research on curiosity, however, a number of questions remain unanswered. One of these is the following: what are the stimulus properties which elicit curiosity in children? In other words, what makes a child "interested" in one thing more than in another. Berlyne (1960) has theorized that it is the "collative" or informational properties of stimuli--for example, novelty, complexity, ambiguity, etc.--that arouse curiosity.

The measure referred to above as curiosity is more appropriately described as a measure of preference for visual complexity. In this study the child was required to operate a viewing-box by pressing his forehead against a bar to turn on a light inside the box. An eye-slit just below the bar allowed him to view a picture placed inside at the rear of the box. Switching on the light simultaneously activated a clock which measured viewing time for each picture to .01 seconds. Two practice cards were administered to familiarize the child with the task and the equipment; the 16 test cards were then presented in a predetermined, counterbalanced order. The child was told to "look as long as you like" at each picture and to "sit back when you are ready for the next one."

The 16 test cards are grouped into eight pairs of drawings; the members of each pair are similar in content but differ in number of stimulus elements (e.g., scattered vs. regular arrangement, multi-colored vs. a single color). The pictures include animals, geometric shapes, and arrangements of small circles and X's.

Total viewing time for the 16 cards provides a measure of the child's ability and willingness to sit still and to focus attention on a single task. The ratio of time spent looking at the eight complex cards to the total viewing time is a measure of preference for complexity, or "curiosity."

Social class differences in mean total viewing time were not great (Table VI-11), and the variation within each group was quite large. There was, however, a consistent tendency in the working-class groups for children living in public housing to have shorter viewing times than children in private homes. Sex differences also appeared: for the two upper groups, boys looked longer than girls, but in the two unskilled working-class groups this sex difference was reversed. These sex differences were maintained within the two housing types.

These data when analyzed in conjunction with the data on Binet test-taking behavior support the conclusion that socioeconomic status is not the primary predictor of attentiveness, but that children in public housing display behaviors less beneficial to a testing situation than do children in privately-owned homes.

The ratio score of preference for complexity (Table VI-12) also showed little overall social class difference, although children in the unskilled working-class groups displayed slightly less interest in complexity than did children in the two upper groups. Housing differences were not consistently related to proportion scores; boys in public housing actually showed a slight tendency toward higher scores than those in private homes, with the exception of the father-absent unskilled group. This trend also occurred among the girls. For all but the father-present unskilled group, boys showed greater preference for complexity than did girls.

Mean preference scores for all groups were around .530 or above, with the exception of the males in the father-present unskilled groups and females in the father-absent group: among them, the children in public housing showed essentially no preference, and those in private housing showed a slight preference for the simple drawings.

The variability of performance and nature of the interactions obtained make any conclusions suspect. However, differences were observed in the range and duration of attention shown by the children from the different social status levels. Since readiness to profit from learning experience is influenced by the child's willingness and ability to attend, these data may be predictive of the child's later school

TABLE VI-11

Mean Curiosity Total Time Scores by Social Status, Sex, and Housing

Social Status	Sex						Housing		Total Children
	Males			Females					
	Public Housing	Private Housing	Total Males	Public Housing	Private Housing	Total Females	Public	Private	
Middle Class	----	137.54	137.54	----	121.01	121.01	----	129.28	129.28
Working Class:									
Skilled	91.32	186.55	136.67	83.10	132.37	108.91	87.41	158.17	122.79
Unskilled:									
Father Present	114.02	118.17	116.09	133.62	208.47	169.08	123.82	160.95	141.91
Father Absent	71.44	104.47	87.95	117.90	138.84	128.87	94.67	122.48	108.92

TABLE VI-12

Mean Curiosity Ratio Scores by Social Status, Sex, and Housing

Social Status	Sex						Housing		Total Children
	Males			Females					
	Public Housing	Private Housing	Total Males	Public Housing	Private Housing	Total Females	Public	Private	
Middle Class	--	.554	.554	--	.513	.513	--	.533	.533
Working Class:									
Skilled	.570	.532	.552	.534	.531	.533	.553	.532	.542
Unskilled:									
Father Present	.504	.476	.490	.537	.492	.516	.520	.484	.503
Father Absent	.532	.546	.539	.516	.477	.496	.524	.510	.517

performance. However, as was observed in the interaction situations, a child's apparent attention to the task may not be correlated with learning. Additional data are necessary to differentiate active attending from a concrete attitude as described by Goldstein and Scheerer (1941) which is passive, unreflective, and open to all stimuli in the environment and which may be characterized by distractibility as well as paucity of thought content.

According to Berlyne the informational attributes of the "complex" stimuli should have attracted all subjects. We do not know, however, if the child's attention to a picture was because he was attracted by the interesting novel stimulus (Fiske and Maddi, 1961) or because he sought to reduce an uncomfortable state of uncertainty or dissonance (Berlyne, 1960; Festinger, 1957). Moreover, much of the variability in performance appeared to be due to the nature of the task. Item analyses suggested the necessity for redefinition of what constitutes collative properties dependent upon the subject's present response repertoire. For example, a winged horse may not be incongruous to a four-year-old. And if it were, preference and viewing time may not be equivalent responses. Recent studies have shown that measures of exploratory choice after brief initial exposures seem to describe an inverted U-shaped function over complexity, such that there is commonly a tendency to attend to the more complex alternatives at a low level of complexity, but to avoid the more complex alternatives at a relatively higher level of complexity (Day, 1968). Selective attention to more complex figures and duration of exploration also seem to increase with complexity up to a peak and then drop off.

One may ask the more general question: what is the best way to measure how curious a particular individual is? Is the child who asks a lot of questions also likely to have a marked preference for visual complexity and also a tendency to explore motorically more than other children? Or does each child have his preferred mode of expressing curiosity along these lines? It is generally believed, and our data tend to support the contention, that unskilled working-class children are less curious than middle-class children. On the other hand, it may be that class differences are reflected more in the mode of expressing curiosity than in the amount. For example, it may be that lower-class children equal or surpass middle-class children in locomotor and manipulatory curiosity. Similarly, the inconsistencies in the findings from previous research on sex differences in curiosity behavior may be due to the methods utilized.

Summary and Discussion

The focus of this chapter, the effect of early experience on the intellectual functioning of the child, has been the subject of a steadily increasing number of research endeavors during the past decade. A major contributing influence has been the writing of Hunt, whose *Intelligence and Experience* (1961) presents an integration of piagetian and information theory. Stressing the interaction of the organism and his environment, intelligence is seen not merely as an inherited capacity, genetically fixed and destined to unfold in a biologically determined manner, but as a dynamic, ongoing set of processes that within wide hereditary limits is subject to innumerable experiential factors.

Consistent with this view, in this study we have investigated the cognitive environment of the preschool child, focusing on the cognitive components of mother-child interaction. The data indicate that maternal teaching styles, reflecting the mother's information-processing strategies, techniques for controlling her child's behaviors, and her attitudes toward education and the schools, are equal to or better than IQ and social class as predictors of the child's cognitive functioning.

Throughout the chapter we have seen that differences in intellectual functioning have been greater within socioeconomic groups than between groups. Our concern has been in delineating those aspects of the environment within homes of the same social status which explain this variation in certain behavioral characteristics among the children. A lack of behavioral alternatives and a restricting parent-child relationship appear to be crucial factors operating against adequate cognitive growth.

When, for example, data from the Sigel Conceptual Style Sorting Task were analyzed and correlated with other maternal and child measures, it was found that the child's scorable responses were significantly related to the number of children in the home, the ratio of children to adults, and the amount of reading material available and used by the child in the home. Given the opportunity for more adult-child interaction in the home, particularly in school-related tasks (i.e., reading), the child tends to be more adept at producing task-relevant responses (i.e., rationales for sorting). It was also found that the mother's inability or disinclination to take an abstract attitude on the conceptual sorting task was correlated with ineffectual teaching on the block sorting task and inability to plan and control the Etch-a-Sketch situation. Measures of effective teaching (orientation factor score) and elaborated language (language factor score) were on the other hand positively related to the child's categorizing ability. It may be the focusing on relevant attributes and rationales plus the language specificity reflected in these factors which help the child delineate stimulus aspects for classifying.

The significance of maternal teaching styles was further seen in sex differences in the child's performance. In the conceptual sorting task, girls were more likely than boys to attempt verbal responses; in open-ended questions, the mothers of girls tended to use more elaborated, differentiated linguistic styles than the mothers of boys and were more likely to give their children rationales for behaving. It was hypothesized that boys receiving more restricted codes are likely to be impaired in their ability to offer verbal rationales for sorting. For both boys and girls, the mother's use of rationales (as opposed to status-oriented and imperative messages) was consistently related to the child's ability to categorize. These results from the Sigel sorting task were consistent with those obtained from the child's performance in the teaching situations. There too it was found that difference in performance related strongly to the verbal and cognitive environments represented by maternal teaching styles.

It should be noted, however, that data concerning the cognitive fun-functioning of the four-year-olds in our sample were limited. This was partially due to the small number of adequately pretested tasks available for appropriate use with this population. Global tests of general intelligence, for example, seem seriously restricted as ways to advance understanding of behavioral variations. In our study, however, we were also interested in educability. An intelligence test score is one indication of the cognitive component in the readiness to learn in a school setting. To profit from ordinary classroom instruction the learner must bring many developed skills to the situation, including voluntary control of attention, self-reinforcement for successful performance, and symbolic mediation. It is in the lack of these cognitive skills tapped by intelligence tests and required for educability, rather than in basic learning abilities, that culturally disadvantaged children appear to differ most from typical middle-class children. So-called deficits in learning performance may be less a factor of intelligence, learning ability, or achievement than a questions of inattention to what is to be learned or a question of attention to irrelevant and distracting features of the learning task, feelings of inadequacy, and difficulty in relating to adults. In this study, we have indicated the importance of the mothers' socializing of certain attitudes toward learning for affecting the adequacy of the child's resulting performance.

These remarks should point out the close intermingling of cognitive and so-called non-intellective factors in the child's behavior, especially during the preschool years. The title of the chapter should in no way imply that we consider cognitive processes to operate independently in the organism and to be available for separate assessment. Inherent in the problem is that only the child's level of acquired abilities is available for testing, not the child's capacity. The child's score indicates the richness of the milieu in which he functions and the extent to which he has been able to profit from that milieu.

CHAPTER VII

MOTHER'S LANGUAGE AND THE CHILD'S COGNITIVE BEHAVIOR[1]

To develop his potential for abstract intelligence, the child must make the transition from manipulating the world of the concrete to manipulating the world symbolically. Moreover, in an advanced society, the individual must develop an ever-expanding competence in the use of symbols and symbolic processes. Vygotsky (1962) has held that "the child's intellectual growth is contingent on his mastering the social means of thought, that is, language," and that words are the "linguistic tools of thought." According to Vygotsky, this process starts with a dialogue of speech and gesture between child and parent. One of the most important roles adults play in socializing the child's cognitive behavior is to demarcate the relevant and important dimensions of experience (Luria and Yudovich, 1959; Vygotsky, 1962). From significant adults in his environment, the child learns what is important for him to attend to; how to give order, structure, and meaning to the relevant environmental stimuli; and how to process, both directly and symbolically, the information he attends to. Children "develop and test their notions (hypotheses) chiefly through verbal interaction with more verbally mature speakers" (John and Goldstein, 1964).

Different social structures have differential effects on language development. A number of investigators have shown that the structure and level of language which a child acquires are related to variables associated with social class (Anastasi, 1958; Cazden, 1966; Irwin, 1948; John, 1963; Lawton, 1963; Milner, 1951; Templin, 1957; Young, 1941). Gordon (1965) has summarized the work in this area. Bernstein, in particular, has explicated the view that the language of a specific social structure conditions what the child learns and how he learns, and sets limits within which future learning may take place (1958, 1959, 1960, 1961a, 1961b, 1961c, 1962a, 1962b).

> Different social structures will emphasize or stress different aspects of language potential, and this in turn will create for the individual particular dimensions of relevance. As the child learns his speech, so he will learn his social structure, and the latter will become the sub-stratum of his innermost experience through the effects of linguistic processing (Bernstein, 1961a).

Bernstein has identified two forms of communication codes or styles of language: restricted and elaborated. Restricted codes lack the specificity needed for precise conceptualization, differentiation, and discrimination, and the effect of such codes is to limit the range and complexity of the concepts and information involved. Lower class individuals tend to be limited to the use of restricted codes, with harmful cognitive consequences (Bernstein, 1961a). An elaborated code, on the other hand, permits expression and use of a wider and more complex range of thought.

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[1] The major responsibility for analysis of maternal language styles and for writing this chapter was assumed by Dr. Ellis G. Olim (Department of Human Development, University of Massachusetts).

A major hypothesis of this study was that language is an important aspect of the child's cognitive environment. Thus it was decided to study mothers' language styles and the relationship between mothers' language and their children's cognitive behavior. As a first step, it was necessary to select and develop language scales to measure various aspects of language behavior along the dimension of elaboration-restriction. A description and rationale for the scales which were developed follows.[2]

Language Scales

Mean Sentence Length

One method of obtaining a simple, global measure of language elaboration, which has often been used in studies of language acquisition by children (McCarthy, 1954), is to take the mean sentence length, or average number of words per sentence.

This measure has been criticized due to lack of a satisfactory definition of what constitutes a sentence. Traditional grammar definitions, that a sentence expresses a complete thought or that a sentence consists of a subject and predicate, are not wholly satisfactory. There still remains the need to define a complete thought, and it is easy to demonstrate the existence of sentences where subject, predicate, or both, are understood from the context of the discourse.

One solution is given in phrase-structure grammar where the definition is related to speech. The native speaker of English recognizes sentence division by three kinds of signals: pitch, stress, and juncture (the joinings and pauses in the flow of an utterance). Contrast the following sentences:

(a) Had he come earlier, we couldn't have seen him.
(b) Had he come earlier? We couldn't have seen him!

If these are read aloud, one can see that the signals that differentiate the two are the differences in the patterns of pitch and stress on certain words, and the length of the pause between the two sentences in the second example.

Mean Pre-verb Length

The mean pre-verb length is the average number of words per clause appearing before the main verb of the clause. However, imperative clauses are excluded from the count because by the nature of the imperative construction the main verb usually occurs first, in such instances obviating the possibility of pre-verb elaboration.

In a "kernel" sentence (a sentence containing only a simple subject and a verb), the meaning is carried in both the subject and the verb, but usually more of the meaning of the sentence is carried in the predicate than in the subject. Thus, until the main verb is expressed, the major meaning of a sentence usually cannot be ascertained. Miller (1962) has shown that left-recursive sentences are more difficult to recall than right-recursive ones. Left-recursive sentences are those in which a syntactic structure or constituent recurs to the left of the verb. For example, a left-recursive construction such as *John's friend's father's car is blue* would be more difficult to recall than *The car is blue, long, and fast*, an example of right-recursiveness. Left-recursive clauses have greater mean pre-verb lengths than do right-recursive clauses.

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[2] Details of each scale will be found in Appendix O.

The child who must listen to qualification of the subject and qualification of the verb not yet articulated (as when an adverb or adverb phrase precedes the verb) is faced with the necessity of storing more information and decoding more complicated schemata than is the child whose mother typically keeps her subjects unqualified and quickly gets to the main verb of the clause. The contrast may be seen in the following sentences.

(a) The child went to the zoo in the morning after breakfast.
(b) In the morning after breakfast, the child went to the zoo.oe

Adjective Range

The general role which adjectives play is to enable the language user to make finer discriminations of expression and thought efficiently. Bernstein (1959, 1961a, 1962b) has emphasized the availability of a discriminate range of adjectives to the user of an elaborated code in contrast to the limited range of adjectives available in a restricted code.

The Adjective Range Scale is expressed as a percentage, and is based on the number of uncommon adjectives, excluding repetitions, divided by the total number of nouns (to adjust for length of the protocol). The category, *uncommon adjectives*, excludes cardinal-numerical, demonstrative, and pronoun possessive adjectives (my, your, his, her, its, our, their); the articles (a, an, the); "other;" and "another."

Adverb Range

An additional part of speech especially suited for making qualifications and discriminations efficiently is the adverb. Bernstein (1962b) has used adverbs to distinguish between users of elaborated and users of restricted codes.

The Adverb Range Scale is expressed as a percentage, and is based on the number of uncommon adverbs, excluding repetitions, divided by the total number of verbs, adjectives, and adverbs (to adjust for protocol length). The category, *uncommon adverbs*, excludes "here," "there," "now," "then," "less," "least," "more," "most," "just," "not," "no," "yes," "how," "when," "where," and "why."

Verb Elaboration

The part of speech that is designed primarily to make predictions about the subject of a clause is the verb. Considerable variation in verb form is a particular characteristic of English. The two devices for achieving variation in verb form are inflection and the use of auxiliary verbs. English verbs are not highly inflected (as compared to Latin and French, for example), and the major method for elaborating verb forms is the use of auxiliary verbs. Also, verbs can be classified functionally along many dimensions so that the same form may serve different functions. When both criteria of classification are used, verbs can be classified into a very large number of different categories. Thus, skilled users of English can generate a large number of different verb forms.

To obtain a measure of verb elaboration, it was decided to count verb forms containing two or more elements in the verb phrase (or stem), excluding repetitions. These are designated *complex verb forms*. The Verb Elaboration Scale is based on the number of different complex verb form types, divided by the number of sentences (to adjust for protocol length).

Complex Verb Preference

In addition to measuring the magnitude of verb elaboration, it was decided to measure preference for the use of complex verb forms compared to simple (single-word) verb forms. The Complex Verb Preference Score is the number of complex verb form types divided by the total number of verb form types, both simple and complex.

Syntactic Structure Elaboration

The increase in elaboration and complexity of syntactic structures with language development has long been noted in developmental studies. McCarthy (1954) has summarized the research in this area, which shows that children's syntactic structures become more elaborated and complex with age. Studies show that children's sentences develop from simple sentences to simple sentences with phrases, compound sentences, complex sentences, and compound and complex sentences still further elaborated (e.g., two or more independent units with one or more subordinate clauses Hahn, 1948) LaBrant (1933) found that the proportion of subordinate clauses to total clauses is an index of language developmental level. Loban (1963) devised a weighted index of subordination in order to achieve a finer-grained index Clauses are given increasing weights for increasing degrees of complexity (e.g., clauses modifying other clauses). Lawton (1963) found social class differences among British boys when he used Loban's index. Loban pointed out that an index of subordination is by no means a perfect measure of structural complexity since prepositional phrases, infinitives, appositives, verbals, participial phrases, and other syntactic structures contribute to language complexity.

LaBrant and Loban have held that subordination is a more mature and difficult form of language expression than simply parallel statements connected by *and* or *but* (Loban, 1963). For this reason, coordinate clauses were not used by LaBrant and Loban. However, though subordination is generally a higher level form than coordination, this is not always so. For example, *John is going but Mary is staying* is at least as complex as *He said that he is going*. The direct object noun clause is in the repertoire of individuals at low levels of language development (*I tole you I done it*).

For the foregoing reasons, the Syntactic Structure Elaboration Scale used in this study includes more types of complex syntactic structures than Loban used. The scale is based on the number of complex syntactic structures, weighted for complexity and divided by the number of sentences to account for protocol length. Complex syntactic structures include (a) coordinate clauses, (b) subordinate clauses, (c) infinitive clauses, (d) sentence-modifying infinitive phrases (as distinguished from noun-modifying infinitive phrases), (e) infinitive phrases appearing in structures of complementation, and (f) sentence-modifying participial phrases.

Stimulus Utilization

The Stimulus Utilization Scale was devised for use with projective measures. A Stimulus Utilization score consists of the number of characters and objects (including parts of characters) present in the projective test picture which the subject uses in the story he reports. This scale is designed to tap a language-related behavior different from the behaviors measured by the preceding scales. The latter are all grammatical scales. The Stimulus Utilization Scale measures the subject's span of attention, his tendency to make perceptual discriminations in his environment, to recognize the salience of certain types of stimuli, and to relate them to one another.

Introduced Content

The Introduced Content Scale was also devised for use with projective measures. The Introduced Content score consists of the number of characters and objects (including parts of characters) *not* present in the projective test picture but introduced by the subject in the story he reports. The tendency to go beyond the stimuli present in the picture seems to be related to imaginative thought elaboration (Henry, 1956). The scale appears to measure the extent to which a person utilizes language for cognitive elaboration of his inner life.

Abstraction

The Abstraction Scale was devised to obtain a measure of the extent to which an individual uses language to express abstract concepts. The importance of abstraction behavior as a measure of cognitive attitude and level has been so long recognized that the point needs little exposition here. The distinction between abstract and concrete attitudes has been useful in clinical psychiatry (Goldstein and Scheerer, 1941; Hanfmann and Kasanin, 1937; Rapaport, 1945). Concept-formation and -attainment studies have been devoted largely to studying how individuals achieve abstract levels of conceptualization. A number of test items in the Stanford-Binet request definition of abstract words and concepts (although, in fact, the words used tend to be not so much abstract as they are words of low frequency). Many other intelligence test items are presumed to tap the subject's ability to engage in abstract thinking (for example, the Similarities subtest of the WAIS).

Concrete thinking is characterized by adherence to immediate experience of objects, situations, or events. It has been shown that the nouns used by young English-speaking children are more reliably the names of things, and verbs more reliably the names of actions, than is the case for the nouns and verbs used by English-speaking adults. The latter tend to use more abstract nouns and verbs (Brown, 1957). In abstract thinking, the individual goes beyond the immediate properties or attributes of the object, situation, or event and attends to inferred or abstracted attributes.

This distinction between concrete and abstract thinking provides a better criterion for classifying words as either concrete or abstract than do dictionary and traditional grammar book definitions, since words apart from context are neither concrete nor abstract. The distinction between whether a word is concrete or abstract lies in the proposition being expressed. For the Abstraction Scale, nouns and verbs were classified in accordance with this criterion. The Abstraction Scale is expressed as a percentage and is based on the number of abstract nouns and verbs divided by the total nouns and verbs, including concrete nouns and verbs. Forms of be and repetitions were excluded from the computation.

Language Elaboration

Four of the scales (Mean Sentence Length; Mean Pre-Verb Length, Verb Elaboration, and Syntactic Structure Elaboration) were presumed to overlap somewhat in what they were measuring. Accordingly, a principal component analysis was made of these four scales across three different samples of each mother's speech. The analysis yielded a language elaboration factor, which was used in subsequent regression analyses in place of the four original scales making up the language elaboration factor. Language Elaboration Factor scores range from negative through a zero midpoint to positive; because of the direction of factor loadings, a negative score denotes greater language elaboration than a positive score. The factor scores were also converted to T scores.[3] A principal component analysis of all the scales showed that the scales not loaded with the language elaboration factor were independent of one another. These other scales were therefore included in the regression analyses.

Data-gathering Procedure

For the language style analysis, three samples of the mother's speech were obtained. In the home, she was asked by the interviewer to describe in detail a typical day in her life. One purpose of this task was to provide a sample of the mother's speech to an adult in an open-ended situation. The mother was also given two projective measures. In one, she was presented with a photograph of a mother and a teacher in a classroom and was asked to tell what might be going on in the picture. In the other projective measure, she was presented with Card No. 3, the "lion-mouse" card of the Children's Apperception Test (CAT), and was requested to tell a story about the picture to her child, who was present; the instructions were standard TAT instructions. The mother-teacher protocol provided a second sample of the mother's speech to an adult (the interviewer) and the CAT protocol provided a specimen of the mother's speech to her child. All interviews were tape-recorded.

The language protocols were scored, independently of the interviews and testing, by coders employed for the purpose. Different coders were used for different scales. However, all scoring was checked for reliability by having two coders work on a 15 percent sample of the protocols. When satisfactory reliability was established, one of the two coders continued the coding of the entire speech sample for the particular scale on which he was working. Rank-order coefficient reliabilities were established for the CAT stories; since high reliabilities were obtained (.93 to 1.00), it was deemed unnecessary to test for coding reliability on the other two speech samples.

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[3] The procedure is detailed in Appendix O.

Cognitive Measures of the Children

To obtain measures of the cognitive level and style of each child, three tasks were used. The Stanford-Binet (Form LM) was used to assess level. The Sigel Conceptual Sorting Task for Children (Sigel, 1963) was used for conceptual style assessment. A block sorting task was used to measure the child's ability to learn a concept (taught by his mother) and to use it correctly in a transfer task.

In the Sigel task, the child is requested to select one of three pictures that is like, or goes with, a presentation picture. There are 20 sets of pictures, with a separate presentation picture for each set, so that the child is asked to make 20 selections. When the child has selected the picture that goes with the presentation picture, he is asked to state the reason for his selection. Verbal responses are scored on the basis of the kind of concept expressed.

When a child gives a correct verbal tag to a conceptual category, he demonstrates both that he has the concept in his repertoire and that he can verbalize it. It is extremely unlikely that a child could verbalize a concept without having a grasp of the underlying, nonlinguistic concept (Brown, 1956). Thus, the task does measure the presence of conceptual categories in the child. However, the converse is not necessarily true, namely, that the child who cannot verbalize the category does not have the category in his cognitive repertoire. A number of the children in the study made sorts which evidenced that they were using a conceptual basis for the response, but the responses were not scorable because of lack of verbalization. For children at the age level and with the backgrounds of the children in this project, a sorting task which allowed nonverbal assessment of cognitive style would probably have been additionally useful.

A large number of children were unable to give scorable responses, and additional scoring categories were developed to cover that contingency. Following is a brief description of the response categories. (Details and examples are presented in Chapter VI.)

Descriptive-- Concepts are derived from the manifest physical attributes of the stimulus, and the conceptual label contains a direct reference to a physical attribute in the stimulus. Descriptive concepts are of two types:

Descriptive Part-Whole -- The basis of these concepts is one of the manifest physical attributes or properties of the paired pictures, such as color (black and white only), texture, shading, shape, or size. This category also included selections in which the concept is based on individual items or parts of figures in the pictures, such as wheels, heads, legs, guns, uniforms, posture, etc.

Descriptive Global -- Concepts are based on some manifest global attribute of the selected pairing, such as the status or occupation of the figures (policemen, soldiers, nurses, trucks, etc.); discrete age categories (children, adults, babies, etc.), sex (males, females), and age and sex (young women, boys, girls).

Relational-Contextual -- Concepts indicate an interdependence among two or more stimuli, the interdependence being of a functional, temporal, or spatial contiguity, e.g., "the horse pulls the stagecoach," "the man is shooting the other man dead." The relationship must be between the stimuli in the subject's pairing and not between the stimuli and any external factor introduced by the subject.

Categorical-Inferential -- Concepts are based on inferred or nonobservable characteristics of the paired stimuli. Each member of the pair is representative of the total class and each instance is not interdependent, e.g., "these are sick people," "they are good."

Nonscorable Verbal Responses -- If a child gave a verbal response which could not be scored in any of the foregoing categories because it was unclear, ambiguous, or irrelevant, the response was placed in this category.

Nonverbal Responses -- Selections were placed in this category when the child gave no reply to the examiner's question regarding the basis of the selection, but simply pointed at the pictures, or said "don't know' or "this . . . that."

Non-sorts -- This category included instances where the child refused to do the task and instances in which the child failed to make a selection.

In the block sorting task, the mother had to teach her child to use two criteria of classification simultaneously in sorting Vygotsky-type blocks, grouping blocks of the same height (tall or short) and with the same mark (X or O), ignoring shape and color. The child was then tested and asked to explain the reason for the grouping. His verbal score indicates whether he attained the concept (i.e., whether he could sort using the two criteria) and also measures the extent to which he could state the rationale for his sort. (This task is discussed in greater detail in Chapter V.)

Social Class Comparisons

The first major objective of the study of maternal language was to test the hypothesis that there are social class differences in language usage. Table VII-1 presents a comparison of the means for each scale and for each speech sample for the four social class groups. Scores for the Abstraction Scale do not appear in Table VII-1 for the Mother-Teacher and Typical Day speech samples. After 54 protocols had been scored for Abstraction (18 for each of the three social class levels), it became clear that the nature of the stimulus demands of the Mother-Teacher picture and the Typical Day task tended to pull explicit and concrete responses from the mothers, discouraging the use of abstract nouns and verbs. Accordingly, abstraction scoring was discontinued. Since the Typical Day task is not a projective measure, there are no scores for Stimulus Utilization and Introduced Content.

Comparison of the means discloses a decided social-class trend with the middle-class mothers usually highest, the skilled-working-class mothers next, and the two unskilled working-class groups last. However, an unexpected reversal occurred in the Introduced Content scores from the Mother-Teacher protocols. This is explainable on two grounds. First, the middle-class mother tended to limit the introduction of characters and objects in this task because of her superior abstract attitude. When she saw the situation as problematic, she was likely to state that perhaps the child had a "behavior problem," and to stop with that generalization. The working-class mother, on the other hand, was more likely to say that perhaps the child hit another child (introduced character) or failed to do his homework (introduced object); she was

TABLE VII-1

Mean Maternal Language Scores for Four Social Status Groups

Speech Sample / Language Scale	Social Status											
	Middle Class			Working Class								
				Skilled			Unskilled					
							Father Present			Father Absent		
	CAT N=40	M-T N=39	TD N=39	CAT N=42	M-T N=41	TD N=41	CAT N=40	M-T N=38	TD N=38	CAT N=41	M-T N=38	TD N=39
Mean Sentence Length	11.40	19.52	13.85	8.74	16.20	11.17	8.14	14.14	10.48	8.42	13.20	9.93
Mean Pre-Verb Length	2.52	3.09	2.23	2.19	3.21	2.12	1.96	2.76	2.07	2.09	2.74	2.08
Adjective Range	32.81	25.87	25.84	29.01	26.31	19.64	32.14	20.39	21.05	31.26	20.43	20.53
Adverb Range	11.14	10.48	11.30	9.41	10.64	10.42	8.58	7.21	10.76	8.22	11.30	15.00
Verb Elaboration	0.59	1.36	0.48	0.52	1.77	0.32	0.46	1.03	0.34	0.44	0.92	0.36
Complex Verb Preference	63.2	63.3	54.7	60.5	59.1	49.8	49.8	56.7	47.6	51.1	58.5	38.8
Syntactic Structure Elaboration	1.07	2.18	1.30	0.70	2.05	0.95	0.50	1.57	0.93	0.55	1.50	0.74

TABLE VII-1 - continued

Speech Sample / Language Scale	Social Status											
	Middle Class			Working Class								
				Skilled			Unskilled					
							Father Present			Father Absent		
	CAT N=40	M-T N=39	TD N=39	CAT N=42	M-T N=41	TD N=41	CAT N=40	M-T N=38	TD N=38	CAT N=41	M-T N=38	TD N=39
Stimulus Utilization	5.8	3.0	--	4.8	2.7	--	4.8	2.7	--	5.4	2.5	--
Introduced Content	3.8	1.4	--	2.6	1.8	--	2.4	1.8	--	2.3	1.9	--
Abstraction	5.60	--	--	4.89	--	--	3.37	--	--	1.75	--	--
Summary Scores		N=39			N=41			N=38			N=39	
Language Elaboration (T Score)		54.51			50.17			47.82			47.20	
Language Factor Score*		-2.17			-0.13			1.07			1.30	

*A high negative score indicates high elaboration, a positive score, low elaboration.

more explicit and concrete in spelling out what she meant. Second, the situation of a mother and a teacher conversing in a classroom was not a stimulus that especially aroused the middle-class mother. The working-class mother, however, was likely to perceive the situation as one in which the mother's child got into trouble, and trouble seems to have elicited more story elaboration. By way of contrast, in the lion-mouse stories, the middle-class mothers had the highest scores for Introduced Content, whereas the unskilled-working-class mothers had the lowest scores.

In the Typical Day protocols, another unexpected reversal occurred. Mothers in the father-absent unskilled group were highest in adverb range, but this finding appears to be artifactual. The adverb scores are derived by dividing the number of uncommon adverb types by the total verbs, adjectives, and adverbs. For some reason, the number of verbs, adverbs, and adjectives used by these mothers in the Typical Day accounts was disproportionately low, producing artificially inflated ratios. (This is a risk one takes in using ratio scales to adjust for protocol length.)

Mann-Whitney Test Comparisons

A more precise comparison of the four groups was afforded by the Mann-Whitney Test, as shown in Table VII-2. Instead of comparing means, this test compares the relative location of the distribution of two groups on a common scale.

As may be seen from Table VII-2, some of the scales show dramatic differences between the middle-class mothers and the other three groups. In some instances, too, the skilled-working-class mothers were significantly superior to mothers in the two unskilled groups.

In general, the Adjective Range scores did not discriminate the groups at statistically significant levels. The Mann-Whitney comparison for the two unexpected results previously reported (Adverbs and Introduced Content) corroborated the results reported with respect to the group means.

Relationships among Language Scores

The second major objective of this study of maternal language was to assess the relationship between mothers' language styles and the children's cognitive styles and intellectual performance levels. However, before examining those relationships, it seemed useful to look at the relationships among language scores across the three speech samples.[4]

When language scores were correlated between tasks, the most striking finding was the almost complete absence of significant correlation. The only significant ($p < .001$) correlations were obtained for mean sentence length, both between CAT and Typical Day samples and between Mother-Teacher and Typical Day samples; and for verb elaboration, between Mother-Teacher and Typical Day speech samples.

[4] See Olim (1965) for a more detailed discussion of intertask consistency.

TABLE VII-2

Significance of Social Status Differences in Maternal Language Scores (Mann-Whitney Test)[a]

Language Scores	Contrasts					
	Middle Class vs. Working Class			Working Class: Skilled vs. Unskilled		Unskilled Working Class: [illegible] Present vs. Father Absent
	Skilled	Unskilled				
		Father Present	Father Absent	Father Present	Father Absent	
CAT Speech Sample:						
Mean Sentence Length	<.001	<.001	<.001	ns	ns	ns
Mean Pre-verb Length	<.01	<.001	<.001	<.05	ns	ns
Adjective Range	ns	ns	ns	ns	ns	ns
Adverb Range	ns	<.05	<.01	ns	ns	ns
Verb Elaboration	<.05	<.05	<.01	ns	ns	ns
Complex Verb Preference	ns	<.001	<.001	<.01	<.01	ns
Syntactic Structure Elaboration	<.01	<.001	<.001	ns	ns	ns
Stimulus Utilization	<.05	ns	ns	ns	ns	ns
Introduced Content	ns	<.05	<.05	ns	ns	ns
Abstraction	ns	<.05	<.01	ns	<.05	ns
Mother-Teacher:						
Mean Sentence Length	<.01	<.001	<.001	ns	<.05	ns
Mean Pre-verb Length	ns	<.05	ns	ns	ns	ns
Adjective Range	ns	ns	ns	ns	ns	ns
Adverb Range	ns	<.05	ns	ns	ns	<.01[b]

Verb Elaboration	ns	<.05	<.001	ns	<.05	ns
Complex Verb Preference	<.05	<.01	ns	ns	ns	ns
Syntactic Structure Elaboration	ns	<.05	<.01	ns	ns	ns
Stimulus Utilization	<.05	ns	<.05	ns	ns	ns
Introduced Content	ns	<.05[bc]	<.05[bc]	ns	ns	ns
Typical Day:						
Mean Sentence Length	<.001	<.001	<.001	ns	ns	ns
Mean Pre-verb Length	ns	<.05	<.05	ns	ns	ns
Adjective Range	<.01	<.05	<.05	ns	ns	ns
Adverb Range	ns	ns	<.05	ns	<.001	<.01[b]
Verb Elaboration	<.01	<.01	<.001	ns	ns	ns
Complex Verb Preference	ns	<.05	<.001	ns	.01	<.05
Syntactic Structure Elaboration	<.01	<.01	<.001	ns	<.05	ns

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[a] Except for the contrast between the two unskilled working-class groups, all tests were one-tailed since direction was predicted.

[b] The mean score for the second group exceeded that of the first group.

[c] Two-tailed test was used since direction was not predicted.

These findings imply that although approximately the same set of language factors can be extracted from the different speech samples, there is no intertask consistency in the mothers' language behavior. Despite the fact of social class consistency--middle-class mothers usually outscore all others, skilled-working-class mothers are next, and so on--this consistency does not extend to the individuals comprising each group.

Intercorrelation of language scores within each social class group showed the same pattern; for the few significant ($p \leq .05$) correlations obtained, mothers within each group were inconsistent across speech samples--for example, middle-class mothers' mean sentence length scores were positively and significantly correlated for the Mother-Teacher and Typical Day samples, but were not significantly correlated for the CAT and Typical Day, and were negatively correlated for the CAT and Mother-Teacher samples. There was also little or no inter-class consistency: where the correlation was positive for one social class group on a particular scale, it was as likely to be negative as positive for another group.

These findings are explained in large part by the nature of the procedures involved in obtaining speech samples. Language is a function of the circumstances in which it occurs, and variation is expected to occur among samples of natural speech collected in different circumstances. In the Cognitive Environment study different situations were deliberately chosen to obtain variation in speech.

To deal more specifically with the data at hand, at least two sources of variance in maternal response to the speech measures are readily apparent. First, in the administration of the Typical Day, mothers were instructed not to describe an abstract typical day--which might have stimulated abstract generalizations--but to describe "yesterday." This instruction was based on the obvious fact that the unskilled-working-class mothers would not respond with lengthy description to the request for a typical day but would go into great detail in remembering what actually occurred on a recent given day. The form of the instructions, however, did affect the nature of potential responses, strongly encouraging mothers to give literal description rather than a generalized one.

Besides the obvious contrast between the more concrete Typical Day task and the two projective-type measures, there was an important source of potential variation between these latter two. In the CAT measure, the mother was instructed to tell a story to her child, and the stimulus picture encouraged her to make up a fanciful tale; in the Mother-Teacher picture, the mother was asked to describe a more realistic and, for some mothers, a more meaningful or familiar one.

In light of these facts about the collections of speech samples in general, and about the particular tasks used in this study, the consistency that did occur, especially for mean sentence length, is rather striking. More important than the issue of consistency in language style, however, is the relationship between maternal language behavior and the child's cognitive behavior. Aside from the specific relationships to be discussed in the remaining sections of this chapter, the basic fact is that the mothers' language--or more generally, their ability to respond in abstract manner to non-specific instructions in a situation such as telling a story to a child--is related to their children's cognitive performance.

Maternal Language Styles and Children's Cognitive Behavior

What are the implications of differences in maternal language for the preschool child? Is there any evidence for assuming that the mothers' language differences, which showed up so clearly in social class comparisons, are related to their children's cognitive ability? To provide information on this question, a series of regression analyses was undertaken. The criterion, or dependent, variables selected were the child's intellectual competence level, as measured by the Stanford-Binet (Form LM), responses to the Sigel Conceptual Sorting Task for Children (Sigel, 1963), and verbal scores on the block sorting task. The predictor, or independent, variables were the following mothers' language scores: Language Elaboration (principal Component factor scores), Adjective Range, Adverb Range, Stimulus Utilization, Introduced Content, and Abstraction; the mothers' WAIS verbal IQs; social class level; and the children's IQs (except when they were used as a criterion variable). IQs and social class level were included because of their presumed relevance to the children's cognitive behavior. All the language scores, except Language Elaboration, were based on only the CAT protocols because the scales were either inapplicable to the other two speech tasks or were of insufficient reliability.

In the following tables, only those predictor variables are presented which were considered relevant or which produced some significant partial correlations with the criterion variable when the influence of all other predictor variables was partialed out.

Child's IQ

The only variable significantly correlated with the children's Stanford-Binet IQs was the mothers' WAIS verbal IQ (Table VII-3). The correlations were significant for the girls IQs, both for the total sample and for the combined working-class groups, but not for the boys' IQs in either case. The differential sex finding is consistent with that of Kagan and Moss (1959), who found that the correlation between young children's IQs and their mothers' IQs tends to be considerably higher for girls than for boys. The correlation for the working-class children was highly significant, but was negligible in the case of the middle-class children. However, lack of middle-class correlation could be attributable to the restricted range and small size of the sample (N=40).

Categorical-Inferential Responses

Turning now to the children's conceptual style responses, the most striking and clear-cut results occurred with regard to the relationship between the mothers' language abstraction and the children's cognitive abstraction as measured by their categorical-inferential responses (Table VII-4). The mothers' and children's abstraction scores were significantly correlated for the total sample, a finding consistent with an earlier study of a sub-sample of 54 (Olim, Hess, and Shipman, 1965a, 1965b). In examining the correlations within the two main social class groupings, we found that only for the middle class was there a significant relationship. It will be recalled that the middle-class mothers were significantly superior to the two unskilled working-class groups

TABLE VII-3

Relevant Partial Correlations of Mothers' IQs
with Children's Stanford-Binet IQs
(with Maternal Language and Social Status Controlled)

Child's IQ and:	Total	Boys	Girls	Middle Class	Working Classes	Working-class Boys	Working-class Girls
df=	1/154	1/72	1/73	1/32	1/115	1/53	1/54
WAIS Verbal IQ	.30***	.15	.39***	.07	.38***	.21	.45***

* $p < .05$
** $p < .01$
*** $p < .001$

TABLE VII-4

Relevant Partial Correlations of Mothers' Language, IQs, and Social Status Level with Children's Categorical-Inferential Responses

Child's Categorical-Inferentials and:	Total	Boys	Girls	Middle Class	Working Classes	Working-class Boys	Working-class Girls
df=	1/153	1/71	1/72	1/31	1/114	1/52	1/53
Mother's (CAT) Abstraction	.25**	.35**	.16	.49**	.10	.04	.12
Child's IQ	.12	.13	.04	-.02	.14	.30*	.02
Mother's Verbal IQ	-.06	-.20	.02	-.28	-.02	-.16	.05
Social Status Level	.07	.16	-.05	--	--	--	--

* $p < .05$
** $p < .01$

in their use of abstract language (Table VII-2). In the children's conconceptual style task, the middle-class children averaged more categorical-inferential responses than the other children (Table VII-5), and a higher percentage of middle-class children made categorical-inferential responses (Table VII-6) (Hess and Shipman, 1965).

When we look at the sex of the children (Table VII-4), we find that the abstraction correlation appears to have greater relevance for boys than for girls. The boys' abstraction behavior was significantly correlated with the mothers' language abstraction, but not the girls.

It is of interest, also, that it was not the mother's abstraction ability but her abstract language behavior that was related to the child's cognitive abstraction. Table VII-4 shows that the mother's IQ is not significantly associated with the child's abstract categorizing

TABLE VII-5

Social Status Differences in Children's
Mean Responses to Sigel Sorting Task

Category	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Relational-Contextual	3.18	2.31	1.18	1.02
(standard deviation)	(3.14)	(2.65)	(1.96)	(1.84)
Descriptive-Global	2.80	2.29	1.51	.98
(standard deviation)	(3.20)	(3.70)	(2.55)	(2.52)
Descriptive Part-Whole	2.25	.71	.20	.34
(standard deviation)	(4.13)	(1.53)	(.47)	(1.30)
Categorical-Inferential	2.02	1.36	1.18	.61
(standard deviation)	(3.63)	(2.78)	(3.02)	(2.22)

TABLE VII-6

Social Status Differences in Percentage of Children Responding
in Each Conceptual Style Category

Category	Social Status			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Relational-Contextual	77.5	66.7	41.0	43.9
Descriptive Global	70.0	54.8	53.8	31.7
Descriptive Part-Whole	40.0	28.6	17.9	14.6
Categorical-Inferential	52.5	45.2	30.8	24.4

behavior, when maternal language abstraction is partialled out. If we look at the relationship between the mothers' IQs and their language abstraction (Table VII-7), we see why this is so. In Table VII-7 are correlations between the mothers' language abstraction scores and their verbal IQ and Similarities sub-test scores. The latter sub-test was included because it specifically measures abstract conceptualizing ability. The correlations between the WAIS Similarities scores and language abstraction were not significant. The mothers' verbal IQs were significantly correlated with their language abstraction in the case of the skilled and father-absent working-class groups, but we have previously seen that the IQs of mothers in the lower status groups were not related to the children's abstraction behavior when maternal language abstraction was controlled (Table VII-4).

TABLE VII-7

Partial Correlations of Mothers' IQs and
Language Abstraction
(CAT Speech Sample)

Language Abstraction and:	Total	Social Status			
		Middle Class	Working Class		
			Skilled	Unskilled	
				Father Present	Father Absent
df=	1/149	1/36	1/33	1/34	1/34
WAIS Verbal IQ	.06	.00	.34*	.00	.36*
WAIS Similarities	.05	.12	-.16	.00	.00

* $p < .05$

The child's IQ seems to have had some effect upon his tendency to make categorical-inferential responses (Table VII-4), but primarily in the case of the working-class boys.

Block-Sorting Verbal Scores

When we examine verbal scores on the block-sorting task (Table VII-8), which represent the children's attainment of an abstract concept, again we find that the mothers' language abstraction scores were significantly correlated for the total sample, for the working-class sample, and for the boys. In this case, however, a significant relationship occurred for the working-class boys rather than for the middle class. The children's IQs were also significantly related to their performance for the total sample, for the boys, for the working-class children, and for the working-class boys. In this task, the mothers' verbal IQs were a significant predictor in the case of the working-class children, the total sample of girls, and the working-class girls. The mother-daughter IQ correlation previously noted (Table VII-3) seems to have manifested itself in this task also.

Other Conceptual Style Responses

As shown in Table VII-9, only one predictor variable was significantly correlated with the children's relational-contextual responses, namely the mothers' language elaboration scores. In the case of descriptive global responses, the mothers' stimulus utilization scores were negatively correlated for the total sample, for the girls, and for the middle-class children. It seems that the middle-class mother low in attention to important stimuli in a projective test picture tended

TABLE VII-8

Relevant Partial Correlations of Mothers' Language, IQs, and Social Status Level with Children's Block Sorting Verbal Scores

Child's Block Sorting Verbal Score	Total	Boys	Girls	Middle Class	Working Classes	Working-Class Boys	Working-Class Girls
and:	df=1/153	1/71	1/72	1/31	1/114	1/52	1/53
Mothers' Abstraction	.16*	.25*	.03	-.04	.21*	.28*	.05
Children's IQs	.28**	.45***	.03	.33	.20*	.37**	-.04
Mothers' Verbal IQs	.15	.09	.25*	-.12	.23*	.20	.37**
Social Status Level	.06	.05	.06	——	——	——	——

* p<.05
** p<.01
*** p<.001

to have a child inclined toward diffuse global responses, particularly in the case of girls. For the middle class only, the mother's introduced content scores were positively related to the children's descriptive global responses, and this relationship was apparently applicable to the girls, not the boys (the correlation was negligible for the total sample of boys and negative for the lower-class boys). It may be that the mother who tends to introduce content in her fanciful stories encourages her child (especially in the case of girls) to engage in global naming behavior. It may be noted that the opposing direction of the signs in the case of the stimulus utilization and introduced content scores was not a function of the relationship between these two scales, since analysis of the middle-class mothers' language scores revealed that they were not correlated.

The children's IQs were significantly related to their descriptive global responses for the total sample; for the boys; for the working-class children and for the working-class boys. As was the case with the categorical-inferential and the relational-contextual responses, the mothers' verbal IQs were not a significant factor in their children's descriptive global responses. Social status level was significant in the case of the girls.

None of the maternal language variables was significant with respect to the children's descriptive part-whole responses. Here, the children's IQs were significant--for the total sample, for the boys, for the middle class, and for the working-class children, but not for the girls. As in the case of descriptive global responses, social status level was significant with respect to the girls.

Children's Non-Verbal Responses and Non-Sorts

There was a significant tendency for children who performed the conceptual sorting task but who were unable to verbalize the basis for the sort to be low in IQ. Similarly, a significant and negative

TABLE VII-9

Relevant Partial Correlations of Mothers' Language, Children's IQs, and Social Status Level with Children's Conceptual Style Responses (Maternal Verbal IQ and Language Scores Controlled)

Conceptual Style Responses	Total	Boys	Girls	Middle Class	Working Classes	Working-class	
						Boys	Girls
df=	1/153	1/71	1/72	1/31	1/114	1/52	1/53
Relational-Contextual:							
Language Factor[a]	-.17*	-.18	-.16	-.21	-.16	-.09	-.26
Descriptive-Global:							
Stimulus Utilization	-.16*	-.02	-.28*	-.37*	-.04	.12	-.16
Introduced Content	.08	-.01	.20	.44*	-.05	-.22	.12
Child's IQ	.17*	.25*	.06	.30	.20*	.28*	.13
Social Status Level	-.15	-.07	-.24*	--	--	--	--
Descriptive Part-Whole:							
Child's IQ	.27***	.52***	.10	.39*	.21*	.23	.25
Social Status Level	.14	-.02	.23*	--	--	--	--

* $p < .05$; ** $p < .01$; *** $p < .001$

[a] A negative score indicates high elaboration, a positive score, low.

relationship was found between the children's IQs and their refusal or inability to make conceptual sorts. None of the other predictor variables was significant. In cases where the children were able to verbalize their responses but the responses could not be scored, there was some tendency for mothers and children to be high in IQ, but the social status level relationship was negative (Table VII-10). This suggests the possibility that these children were in a transitional "pre-verbal" phase of development.

Discussion

The major question to which this portion of the study addressed itself is whether there is any relationship between the mothers' language and their preschool children's cognitive ability. Assuming such a relationship were found, could it be explained on the grounds that

TABLE VII-10

Relevant Partial Correlations of IQs and Social Status Level
with Children's Non-performance on Conceptual Style Sorting Task
(with Maternal Language Scores Controlled)

	Total	Boys	Girls	Middle Class	Working Classes	Working-class	
						Boys	Girls
	1/153	1/71	1/72	1/31	1/114	1/52	1/53
Non-verbal Sorts							
Child's IQ	-.30***	-.28*	-.29*	-.35*	-.30**	-.31*	-.30*
Non-sorts							
Child's IQ	-.18*	-.28*	-.00	-.18	-.21*	-.34*	-.03
Nonscorable Sorts							
Child's IQ	.14	.16	.11	-.03	.21*	.26	.15
Mother's IQ	.21**	.20	.20	.28	.13	-.02	.18
Social Status Level	-.22**	-.26*	-.20	--	--	--	--

* $p < .05$; ** $p < .01$; *** $p < .001$

the significant factors in the relationship are the mothers' IQs, or the children's IQs, or the family's social status level? It is, of course, well known (and this research confirmed it) that middle-class mothers and children have the highest average IQs and that average IQ decreases progressively with lower social status level. The method chosen for examining the relationships among these variables was multiple and partial correlation, to determine the influence of IQ and social class level when the influence of other variables was controlled for. When this method was employed, a number of interesting results emerged.

In the first place, social class level turned out to be a major predictor variable only in the case of the girls' descriptive part-whole (analytic) and descriptive global responses and responses which were too ambiguous to be scored. We have previously observed from the Mann-Whitney tests that there were large social class differences in maternal language styles. Furthermore, we have seen that there were marked differences by social status in the children's responses to the Sigel task. Yet, when other variables are controlled for, social class appears to be of only limited relevance as a predictor except on a broad group basis. This supports the view that social class is an umbrella variable, which in simple correlations often masks the effect of covert variables associated with social class status.

Secondly, the child's own IQ was an important positive factor with respect to descriptive global and descriptive part-whole responses, and block sorting verbal scores; and it was positively related to the ability to perform on the Sigel Conceptual Style Task. However, in these instances maternal language variables were also significant. Because of the contribution of various maternal language variables, one cannot conclude that the child's IQ "explains" his conceptual style responses Furthermore, IQ was negligible with respect to the other two conceptual style categories. However, in the case of children who could not or did not explain their sorts verbally or make cognitive sorts, the only significant factor was the child's low IQ. In the case of non-performance, therefore, it seems reasonable to conclude that the child's low IQ was the major factor.

The mother's verbal IQ was a significant and major predictor of only two criterion variables: the child's IQ and the child's verbal performance on the block sorting task. It is noteworthy that although the mother's IQ contributed to her child's success in a concept attainment task where the mother had to teach the concept to her child, her IQ was not related to the child's behavior in a cognitive sorting task designed to measure the child's existing repertoire of potential responses. The mother's language, on the other hand, was a major predictor of the child's performance on both tasks. It will be recalled that in the case of abstract categorizing the mother's abstract language alone was a significant and major predictor of the child's performance.

Perhaps one of the most positive results of the research is that a beginning has been made toward discovering the precise language mechanisms which mediate between cultural experience and cognitive behavior. It seems clear, from this study, that language does play an important role in the socialization of cognitive behavior; a good example is the previously mentioned finding with respect to abstract conceptualization, that neither the mother's abstraction ability, her general verbal intelligence, nor the child's IQ was significantly related to the child's performance. Only the mother's language abstraction was significantly correlated. Furthermore, the relationship occurred primarily with respect to the middle class. One important inference to be drawn from these results is that there is an abstraction factor in the middle-class mother's language which may have far-reaching implications for the subsequent intellectual development of the child. We know that as one proceeds up the educational ladder, school subjects and IQ tests tend more and more to measure verbal abstraction ability. It may be that the seeds of this ability are planted during the child's preschool years. This research tends to support the hypothesis that it is the verbal environment of the typical middle-class home that is the major contributor to the child's starting on the road to abstraction behavior of a high order. Conversely, the absence of this kind of verbal environment appears to create an enormous deficit in the potential educability of the working-class child.

This study showed that large, sometimes dramatic, differences exist among social class groups, with a clear social class level trend. The middle-class mothers were consistently the highest on all scales and tasks (with the exception only of introduced content in the Mother-Teacher protocols). The skilled-working-class mothers generally coming next, and the two unskilled groups usually scoring the lowest. The middle-class mothers spoke in longer sentences, exhibited a wider range of adverbs, manifested a larger repertoire of complex verb types, used more complex syntactic structures, exhibited greater perceptual discrimination as shown by their attending to more of the stimuli in test pictures, displayed more abstract concepts in their language usage, and in the case of the fanciful story told to the child, showed more imaginative thought elaboration by going beyond the information given and introducing characters and objects not manifest in the lion-mouse picture. However, with respect to the mother-teacher test picture, the working-class mothers were significantly higher than the middle-class mothers in introduced content. It was concluded that although these findings were due in part to the inferiority of the working-class mothers in describing a situation in generalized terms, another factor appeared to be present, namely that if the task is stimulating enough to working-class individuals, they, too, are able to go beyond the information immediately given; they are not necessarily stimulus bound.

With the one exception just noted, the working-class mothers showed a general picture of language restriction--a restriction that became greater with lowered social class level. The working-class groups consistently spoke in shorter sentences; demonstrated a narrower range of linguistic subtlety and elaboration, as evidenced by their smaller repertoires of adverb and complex verb types and their tendency to use simpler syntactic structures; exhibited a more constricted perceptual system, as shown by their lowered attention to the stimuli in test pictures; displayed a marked inability to use abstract concepts; and evidenced a deficit in the area of imaginative thought elaboration when asked to fabricate a fanciful story.

This study suggests that perhaps one effective method for enhancing the cognitive development of the culturally disadvantaged c child is to take steps in the preschool years to expand his linguistic environment and to encourage him to appreciate the values, intrinsic as well as extrinsic, of using language as a cognitive tool.

CHAPTER VIII

SOCIALIZATION TO THE ROLE OF PUPIL

The socialization model of development asserts that the child in the preschool years not only learns factual information from significant adults in his environment but also adopts attitudes and behaviors deemed appropriate to his status in relationship to other people and to social institutions. The well-documented evidence that the child from a lower working-class background is educationally retarded when he enters school has been typically interpreted as a reflection of lack of learning, of deficiencies in the home environment. The interpretation offered here is rather that the working-class child's failure to succeed academically is--in part, at least--a manifestation of the gap between the behaviors and attitudes which typify working-class homes and the demands and expectations of American middle-class culture as expressed in institutions such as the public schools.

This study was concerned with describing elements of the environment--especially maternal behavior--which influence the preschool child's educability. Educability refers to a cluster of cognitive skills (e.g., language, concept formation, visual and auditory discrimination), to the child's motivation to learn in a classroom setting (curiosity, need for achievement, etc.), and to his acceptance of the role of pupil. This chapter is concerned with this last component of educability. The role of pupil, implicitly defined by current educational practices, includes understanding and acceptance of a hierarchical compliance system and of the scholastic goals and values of education, an active interest in the academic environment, and active involvement in the learning process.

The behaviors demanded of a pupil will vary from institution to institution, and the role learned by a child will be a function of his home environment as well as of his school experience; there is no standard role of pupil. But the problem of learning how to be a pupil exists for all children. Because solutions to this problem may sometimes contradict what is necessary to cognitive growth, the role of pupil as defined here is not meant as an ideal standard; it is not necessarily assumed to include the behaviors most functional for the child's ultimate academic achievement. But these behaviors are required in contemporary school settings. Thus the definition of the role of pupil offered here may not describe those behaviors most conducive to cognitive growth or to academic achievement; the assumption is made, however, that these behaviors are empirically related to success in the major urban educational institutions.

The explanatory model for transmission of this role includes several elements: mothers' attitudes toward education and toward their own role within the educational system provide a model for young children; in everyday interaction with their preschoolers, mothers convey their attitudes and beliefs about social institutions; they define for their children the role they are expected to play as pupils within such an institution as the public school. Successful socialization should lead to a set of behaviors conducive to learning: the child is capable of establishing a good working relationship with his teacher, he is prepared to deal with her both as an authority and as a source of information, and he has confidence in his abilities to manipulate materials and attempt challenging tasks. Unsuccessful or maladaptive socialization is expected to lead to a poor teacher-child relationship and the blocking of information transmission, and to a set of behaviors disruptive to the learning situation.

The working-class child, developing within a matrix of adult ideas which do not fit those assumptions made by major institutions such as the schools, is less educable, not because he has learned nothing during the preschool years, but because he has learned the wrong things. Particularly for the Negro from a lower working-class background, who faces racial prejudice in addition to social and economic circumstances which limit access to middle-class society, models and standards for middle-class behaviors and attitudes are generally not available. A child who has learned to be compliant and submissive, to regard himself as ineffective in dealing with authority and inadequate in problem solving, comes to school unprepared to meet the demands which are made upon him.

It is useful, then, to view the educationally disadvantaged child as presenting a problem in acculturation. This view holds that a large segment of our population has not learned the behaviors necessary for success in school and in other middle-class institutions. In these instances, the school must serve not only as a socializing agent but as a resocializing institution. The child who comes to school from a disadvantaged background brings with him the concept of school held by his family and other members of his community. This early orientation toward school is apparently dysfunctional, interfering with his attempts to meet the school's demands and with its attempts to reach and motivate him.

It was in this context of disparity between the lower working-class family and the school that the staff of this project began to examine the ways in which a mother prepares her child for school experience, and to study the differential orientation provided by middle- and working-class mothers. Our hypothesis was that the preschool experience of the working-class child leads to patterns of responding and ways of relating to authority which are not adaptive for academic learning and which alienate him from the structure of the classroom and prevent him from taking advantage of the cognitive experiences available there.

In this chapter we will present data relevant to several questions about the mother's role in socializing her child into the behavior expected of pupils in a major urban educational system. These questions include:

(a) What attitudes do the mothers of our research group express toward education and toward the school? What changes would they make, given the opportunity?

(b) How do the mothers perceive and describe their status and role relationships in interaction with the school as an institution and with the teacher as its main representative?

(c) What images do the mothers hold of school and of the complementary role of pupil? What behaviors do they believe are appropriate for pupils in a classroom setting?

(d) What are the mothers' aspirations for their children's educational achievement?

(e) What relationships appear between the attitudes and practices of the mothers and the cognitive and school-relevant performance of their children?

Mothers' Attitudes Toward the School

The primary instrument for assessing the attitudes the mothers held toward the school was composed of rating scales developed through interviews and a number of pilot administrations and item analyses. The final instrument used in the project included 27 items, each of which was to be rated on a five-point scale from "strongly agree" to "strongly disagree." A factor analysis of the responses yielded six factors accounting for all items: each item was heavily loaded with only one factor. (See Appendix Q for more detailed information on the instrument and a list of items ordered by factors.)

Scores on each factor were obtained for each subject by summing responses (on the five-point scale) to the individual items comprising each factor in such manner that a high score represents agreement with the individual items contained in the factor. Mean scores for each of the four socioeconomic status groups, on each of the six factors, are reported in Table VIII-1. _t_ tests were computed for differences between mean scores of each group contrasted with every other group; those reported here as significant reached a probability level of .05 or better.

TABLE VIII-1

Social Status Differences in Mean Scores on Six Educational Attitude Factors

Attitude	Social Status				Possible Range of Scores
		Working Class			
			Unskilled		
	Middle Class	Skilled	Father Present	Father Absent	
"Powerlessness"	7.0	8.0	10.0	10.7	0-20
"More Traditional Education"	6.0	7.4	7.0	8.3	0-20
"Improvement through Education"	15.3	17.0	18.7	18.3	0-24
"Approval of Schools"	8.8	9.0	10.6	9.8	0-16
"Irrelevance of Education"	6.4	5.8	5.0	5.3	0-12
"Disparagement of Schools"	11.6	11.6	12.0	11.6	0-16

Factor one includes five items which suggest powerlessness, frustration, and the futility of attempting to exert any pressure either against the system or against the natural unruliness of children. Middle- and skilled-working-class mothers tended to disagree with the statements loaded heavily with this factor, while mothers in the two unskilled-working-class groups tended to agree with them. All differences between classes were significant except that between the two unskilled groups.

Factor two suggests a concern with traditional educational practices and complains about the waste of time in extracurricular activities provided by the school. Although social class differences were not so great as on the first factor, middle-class mothers tended to disagree more strongly with the central theme of this factor than did working-class mothers. The middle-class group differed significantly from both the skilled and father-absent groups.

The central theme of factor three is optimistic striving for achievement through education. The factor is composed of items which express positive feelings of reliance on education for bettering one's lot. All mothers tended to agree with such items, but working-class mothers' responses were stronger in that direction. All cross-class comparisons were significant except that between the two unskilled working-class-groups.

The items comprising factor four express positive attitudes toward the school system, and an emphasis on the importance of obtaining formal education. Middle- and skilled-working-class mothers tended to agree less with the central theme than did the unskilled-working-class mothers, who endorsed such statements. All social class differences were significant except that between the middle- and skilled working-class groups. The stronger approval of schools voiced by the unskilled groups might indicate in part greater acquiescence and concern with endorsing "respectable" notions.

The items in factor five express the belief that education is not necessary to a meaningful life: other pursuits can be as satisfying. Middle-class mothers tended to agree with the statements comprising this factor, mothers in the two unskilled working-class groups to disagree. Middle-class mothers differed significantly in this from both unskilled groups. Again, some of the socioeconomic variation may be due to differences in the freedom subjects felt to express such unconventional ideas, especially to persons associated with the University.

The sixth factor does not express as clear-cut a theme as the other five, and there were no significant mean score differences found among the four groups on this factor. (Since this is the final factor, it may be less stable.) All social class groups tended to agree with this set of items, comprising common criticisms and disparagement of the public schools, perhaps best described as a "gripes" factor.

In their attitudes toward education, then, middle-class mothers tended to deny powerlessness against the authority of school, to reject both a traditionalism which dictates more work and less play, and an endorsement of formal schooling as the only means to a better life, and they tended to agree with the notion that there are other endeavors as important and relevant as education.

Skilled-working-class mothers showed less strong feelings on most attitude factors, but they tended to agree with middle-class mothers in denying that they are powerless and that education is the central means for bettering one's lot in life.

Mothers in both unskilled working-class groups agreed with statements expressing the futility of attempting to use one's power against the school system, but they also tended to agree with the notion that a good education is an important means to improving one's status. In addition, mothers in these two groups tended to express or endorse a traditional attitude which emphasized working and not wasting time on play.

Mothers were also given an opportunity to reveal their views and feelings about the school during the home interview when they responded to the question: "If you had the power to do as you wished about education in the schools, what would you do?"

Mothers' responses to this question were grouped into nine categories, including four which represented different types of failure to respond: a suggestion that improvement was needed without mentioning a specific area or method of change, e.g., "Raise the level of education" or "Prevent dropouts;" a personal action which could be taken by the individual without having any special power, e.g., return to school herself or join the P.T.A.; a statement that the schools are "OK now," or don't need any improvement; and a statement of lack of information on the issues or lack of interest in them.

Of the remaining categories, four define changes which are commonly held to be within the domain of an educational system (changes in curriculum or other academic aspects; changes affecting the school's physical plant or mechanical and administrative functions, such as the need for more schools and teachers or for special facilities; discipline of children; and changes in the training of teachers or in their motivation and dedication); and the final category defines the school as a social-political institution or an instrument of social change (integration, school-community, and parent-teacher relationships).

Although more than one type of response was accepted for this open-ended question, the majority of mothers gave short replies containing only one suggestion; 16 middle-class mothers, 7 skilled-working-class and 4 in the unskilled groups (3 father-present, 1 father-absent) made suggestions in more than one area. This fact is apparent in Table VIII-2, where the number of respondents in the various categories do not sum to the total number in each group.

Because the number responding in any one of the nine specific categories was very small, the response types were grouped into the three main categories described above. Chi-square values (for use vs. non-use), were computed for each of these three response groups, and social class differences were significant for each. Twice as many mothers in the two unskilled working-class groups as in the middle- and skilled working-class groups did not use this opportunity at all--the majority made vague references to improving the schools, said they had never thought about it, or did not know what they could do--while twice as many middle- and skilled-working-class as unskilled-working-class mothers made concrete suggestions for changes in curriculum, in physical and administrative aspects of running the schools, in discipline, or in training of teachers. Finally, as many middle-class mothers as mothers in all other groups combined discussed issues involving the school in a wider social and political system.

TABLE VIII-2

Mothers' Suggestions for Improving the Schools, by Social Status

Category	Number of Responses in Each Category				Test of Use vs. Non-use of Each Category	
	Middle Class	Working Class				
		Skilled	Unskilled			
			Father Present	Father Absent	X^2	p
Essentially None	5	11	19	21	18.394	.001
Educational	28	28	15	18	12.293	.010
Social, Political	14	5	7	2	14.057	.010

The Role of the Mother in Interaction with the School

A mother's feelings about herself and her relationship to the school system may set the pattern for her child's perceived relationship of individual to institution. How does a mother describe her role in interaction with the school, particularly with its main individual representative, the teacher?

To examine this question, each mother was asked to relate what was happening in a photograph of a mother and a teacher seated at a large desk in a school classroom. The mother was given the following instructions: "Here is a picture of a teacher and mother together in a school classroom. Can you tell a story about why the mother came to school and what they're talking about here in the classroom? We would like to know what is happening in the picture and what will happen as the result of their conversation."

The first distinction made was whether the meeting between mother and teacher was perceived as a problem-oriented session, as reported in Table VIII-3. In each group more mothers described the meeting as problem-oriented than did not, but the difference was less for the middle-class group than for the other three. Among those mothers describing the meeting as problem-oriented, there were no clear trends as to differences in the type of problem described.

Responses to the mother-teacher picture also allowed for a reference to the initiator of the meeting, as reported in Table VIII-4. Nearly half of all respondents gave no information as to the initiator; approximately one-third said that the mother had taken the initiative, one-fourth that the school had called the mother in, and a small number saw the meeting as a regularly scheduled conference or a social visit.

With slight exception, more respondents within every social class group attributed initiative to the mother than to the school or teacher; the proportion attributing initiative to either increased with lower social class level, as did the difference in proportion attributing initiative to the school. That is, more working-class mothers than middle-class mothers attributed initiative to either the mother or the school; in addition, the proportion attributing it to mother rather than to the school was greatest among the working-class mothers.

The middle-class mothers tended to describe the meeting as a regularly scheduled, non-initiated conference or a friendly visit almost as often as they described either mother or teacher as initiator.

TABLE VIII-3

Mothers' Views of the Purpose of a Mother-Teacher Meeting, by Social Status

Reason Given	Number of Mothers Responding in Each Category			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Academic Problem	4	10	7	8
Behavior Problem	6	7	4	8
Academic and Behavior Problem	3	9	10	7
Unspecified Problem	13	10	8	5
Subtotal	26	36	29	28
No problem; friendly visit	13	2	9	10
Unknown	1	4	2	3

TABLE VIII-4

Social Status Differences in Perceived Initiator of Mother-Teacher Meeting (Mother-Teacher Protocols)

Source of Initiation	Number of Mothers Responding in Each Category			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
School	7	8	13	7
Mother	8	12	13	11
Regularly scheduled meeting	5	0	2	2
Don't know or vague	19	18	10	18

A more telling statement of mothers' feelings about their relationship to the school and its representatives was afforded by their description of the relationship between mother and teacher in the photograph. Primarily among the considerations in scoring responses for mother-teacher relationship were the relative status positions ascribed to the two women by the respondent and the affective tone or mood of the described interaction. A third consideration, especially if there was a problem being discussed, was whether the outcome was described as good, hopeful, or poor. Scoring categories and number of respondents utilizing each are reported in Table VIII-5.

TABLE VIII-5

Mothers' Description of the Nature of the Mother-Teacher Relationship, by Social Status (Mother-Teacher Protocols)

Relationship	Number of Mothers Responding in Each Category			
	Middle Class	Working Class		
		Skilled	Unskilled	
			Father Present	Father Absent
Good; cooperation of equals	9	1	1	0
Neutral; working together	14	15	7	12
Mother passive	4	9	15	9
Friction, resolved	6	6	3	7
Friction, unresolved	3	5	6	5
No information or vague	3	2	6	5

Although differences between groups were not statistically significant, there were some differences in trends of response. The greatest proportion of respondents described the relationship as a working together of the two women to reach a solution or agreement, with neither dominating and with no friction between them. This response was more typical, however, of the middle- and skilled-working-class mothers than of unskilled-working-class mothers; the latter tended to describe the mother as a passive figure seeking information and advice from the authoritative teacher. A slightly larger proportion of mothers in the two unskilled groups than in the other two tended to attribute some negative affect to either or both parties.

A response describing the relationship as one of equality in which the affect was explicitly positive and both parties were exchanging information and gaining insight was found far more often among middle-class mothers than among mothers in any of the other groups. Finally, lack of information about the relationship or its affective tone was far more typical of mothers in the unskilled working-class groups than in the middle or skilled working class.

Middle-class mothers, then, saw their role in interaction with the school and its representatives as one of equality; the mother-teacher meeting was typically seen as a friendly visit between equals who were interested in gaining insight into the child's behaviors.

Skilled-working-class mothers showed a broader range of response, but tended to be, like the middle-class mothers, relatively unconcerned about the issue of who initiates a mother-teacher conference. While they did not emphasize positive affect and equality to the extent that middle-class mothers did, they did tend to describe the mother-teacher relationship as the two working together toward a common goal.

Mothers in both unskilled working-class groups tended to attribute initiative to the mother more than to the teacher or school, but to describe the mother's role in a conference as a passive one: mother went to the school to ask the teacher what to do, or she went to "get satisfaction" from the teacher for something that had been done to her child; and the conference was characterized by friction between the two which might not be resolved. Mothers in the unskilled groups were also more likely than middle- or skilled-working-class mothers to ignore or to describe only vaguely the affective relationship between the mother and teacher, perhaps suggesting that they would rather say nothing than express negative feelings.

Mothers' Definitions of the Role of Pupil

How a mother defines the school indicates which aspects of the new situation (i.e., new to the child) are most important to her. The preschool child's notions about school are likely to be hazy and inaccurate. Until he has entered and actually experiences this new realm, he cannot really know what school is. He can, however, anticipate it, especially if his mother prepares him. This preparation will focus the child's attention on those aspects she deems most important. While she may never actually tell her child what she thinks of school nor describe the daily routine of a classroom, she will express her attitudes and expectations implicitly; in her everyday interaction with the preschool child, the mother indirectly guides him in developing attitudes as well as skills and shapes the behavior she believes will be necessary for his success in school.

To obtain the mothers' definitions and perceptions of school, they were asked to imagine that it was the first day of school: "Let's imagine that your child is old enough to go to the public school for the first time. How do you think you would prepare him? What would you do or tell him?"

Responses to this question were scored for six categories.[1] The "obedience" category includes responses in which the mother defined school as a situation where the child would have to behave in a socially accepted and obedient manner toward the teacher and/or his peers; to conform to classroom routine; to follow a set of rules pertaining to health, safety, and property rights; or simply to behave or be nice without a referent for that behavior. For example, a mother in the father-absent unskilled group said that she would tell her little girl,

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[1] Additional analysis of responses to this question--maternal control strategies and the consequences for educability--are examined in Chapter IV.

> "to obey the teacher. Do what the teacher asks her to do and that's all to do or say. Just tell her to sit quiet and listen at the teacher and do whatever the teacher tells her to do and get her lessons."

Another, less concerned with school itself than with getting there and home safely, said,

> "I would tell him to be aware of cars, you know don't step out in front of a car is something that is dangerous. And don't pick up different things that don't concern him. Go straight to school and come straight home from school."

A somewhat less explicit statement of the importance of obedience was given by a mother in the father-present unskilled group:

> "Well, the first time I would tell him to be nice and learn to listen to the teachers and do what they tell him to do and mind,"

while a skilled-working-class mother listed a group of behaviors she expected her child to remember:

> "I'd tell him to go straight to school and stop at the patrol lady . . . don't cross, because she tells you to. Mind your teacher; be nice, raise your hand, and when you have to go to the bathroom ask her, you know, and don't talk in school, don't eat any candy or chew any gum. Be nice."

Middle-class mothers tended to elaborate more and to suggest rather than to demand obedience:

> "I will tell her that she is beginning her education. And here she will learn to play with other children. She will learn to listen to the teacher and how to act properly in a control situation such as not talking out any time she wants to. . . . And I will tell her to be very cooperative and do whatever the teacher wants her to do. And try and be friendly and get along with the children."

Another middle-class mother drew an analogy between obedience at home and at school:

> "The only thing I will definitely stress to her is authority, that the teacher becomes the authority head. Mother and Daddy are the authorities at home, and that she has to respect and obey the teacher, and likewise the teacher will respect and obey her wishes, and I think this is mainly what I will tell her about it; that there is authority outside of the home and this is it, you are just going into it, your teacher will be your main center of authority at school and you must obey her as I want you to obey me."

A second response category defines school as an opportunity to attain increasing levels of achievement in academic skills. A mother might say, as did one in the father-absent unskilled group,

> "She's going there for to learn things which will help her for whatever she might want to be when she grows up;"

a mother in the father-present unskilled group said,

> "I'd tell him that I want him to go to school so that he can prepare himself how to work or help him get a good job."

In addition to defining school as an authority system or as an educational system, some mothers were concerned with beginning school as an emotional or affective experience: mothers anticipated their children's fears of the new and strange experience, and they stressed the adventurous aspect of meeting new people and the change in status from baby to "big boy." One middle-class mother concerned with affect spoke only in positive tones:

> "First of all, I would take him to see his new school, we would talk about the building, and after seeing the school I would tell him that he would meet new children who would be his friends, he would work and play with them. I would explain to him that the teacher would be his friend, would help him and guide him in school, and that he should do as she tells him to. That will be his mother while he is away from home."

A mother in the father-absent group was more explicit about the potential negative feelings:

> "Well, by her being kind of bashful, the first thing I think I'll have to go with her. And tell her that she only have to stay there for a few hours and play with the kids. And everything's going to be fine. And she'll be able to come home. I'll come and pick her up when school is out."

A vivid statement of mixed emotions was given by an unskilled-working-class mother:

> "I know he gonna be ner- frightened, you know, to stay there by hisself, uh with the teacher. I just don't know what I would tell him. I try, I'd tell him that, uh, don't be afraid, uh, tell him how nice the teacher is, and uh, tell him, uh, that he gonna have a lot of fun, you know, with the drawin' and everythin', and uh, playin' with the rest of the kids. Lots of kids there to play with--the rest of the children. And I'll tell him that I'll be back for him, and uh, it's fun, it's a lot of fun to go to school, 'cause he looks forward to goin' to school, but I know that first day, I know how it is that first day, when your mother leave you, you just don't know what to do."

Responses to this open-ended question often included statements which did not directly answer the question. Mothers mentioned actual experiences the child had had which they felt were helpful in preparing him for school, such as visiting the school or playing and talking about school with older siblings and friends, or actual skills that they had attempted to teach him themselves, such as tying his shoes, or learning his ABC's. A skilled-working-class mother related that she would tell her daughter,

> "how to undress and pull off her shoes and rubbers and how to go to the washroom, hang her coat and hat and things like that."

Concern with preparation for the academic aspect of school was expressed by a mother in the father-absent group:

> "I would help her with her ABC's, things like that. I would help her learn to count, you know, and do as much as I could to help her."

Finally, some responses were too vague to be scorable, and others were not relevant to the question at all.

The coding system devised for responses to this question defines a unit as a completed thought, usually a subject-and-predicate clause. For each respondent the number of units devoted to each scoring category of response can be expressed as the percentage of the total number of units contained in her response. It is for this reason, incidentally, that vague and irrelevant response-units were included in the total score. Table VIII-6 reports the average percent usage of each category within each of the four socioeconomic status groups. Also reported in the table are the average number of different response categories utilized by subjects in each group and the average number of total units.

TABLE VIII-6

Social Status Differences in Use of Response Categories
(First Day Protocols)

Type of Response	Mean Percent Use			
		Working Class		
	Middle Class	Skilled	Unskilled Father Present	Unskilled Father Absent
Obedience	21.3	49.1	44.2	46.7
Achievement	2.2	1.4	2.9	3.2
Affect	31.2	14.3	14.5	21.5
Preparation	8.6	3.9	1.1	1.3
Vague	16.4	13.7	23.4	17.5
Irrelevant	19.6	15.2	13.2	12.8
Item	Mean Number			
Alternatives	3.8	4.0	3.3	3.9
Total Message Units	9.8	8.9	6.5	7.6

Overall level of response did not vary much among the four groups although a slight trend is seen for both total length and variety of response to be greater at the upper socioeconomic levels.

It is clear that the total response is partitioned differently by the four groups of mothers, with an especially marked differential use of obedience and affect categories by the middle-class mothers as contrasted with the other three groups. The middle-class mothers were apparently more concerned with the emotional aspects of the new situation, with its meaning to the child, than with his conduct; they were perhaps more aware of the emotional aspect than were mothers in the other social class groups and more confident concerning their child's conduct.

As a group, mothers paid only slight attention to academic achievement and formal preparation for school, although middle-class mothers did show a greater tendency to relate relevant incidents, either coincidental or purposeful, to which their children had been exposed. Vague and irrelevant statements made up more than a third of the total response in all groups. It is interesting to note that in the middle- and skilled working-class groups irrelevant statements were more common, whereas in the two unskilled working-class groups vague responses predominated, especially in view of the fact that responses labeled "irrelevant" generally took the form of ramblings about unique, personal qualities of the child or his anxious anticipation of beginning school. "Vague" responses reflect restricted language codes, as described in Chapters V and VII, and may be due in part to the mothers' difficulties in understanding the task and in assuming an abstract attitude.

It seems, then, that the "typical" middle-class mother was aware of the emotional implications of the first school experience for her child and was sensitive to his need for reassurance which would make this new adventure less strange. She tended not to define a mother-teacher meeting as a discussion of specific problems with her child, but as a friendly exchange. She made specific suggestions for changes in the school system which indicated her awareness of the various functions of the school and her ability to affect them, and she perceived the school system in its relationship to the larger society.

The "typical" skilled-working-class mother stressed both obedience to a new authority, the teacher, and general good deportment, in her expectations of the child's behaviors on beginning school; she defined school as a place in which the child is expected to conform to a new routine. More than mothers in any other social class group, she tended to describe a mother-teacher meeting as a problem-oriented session, the topic being her child's grades or a combination of his grades and conduct. She made concrete suggestions for changing the school, specifically in its physical-administrative functions and in the quality of its teachers.

The "typical" unskilled-working-class-mother also defined the school as a situation calling for conformity and obedience to authority. She tended to see a mother-teacher meeting as a conference oriented toward some problem; while she may have been relatively unspecific as to its nature, it was apt to involve her child's school work and perhaps also his behavior. Given the opportunity to make suggestions for changes in the school, she agreed that there was need for improvement but she did not know what she herself should or could do.

The unskilled-working-class mothers on public assistance (father-absent group) were very similar to the other working-class mothers in their definition of school as a system of authority in which the child must conform and be good. The "typical" mother in this group tended to view a mother-teacher meeting as a session oriented toward solving a specific problem: the child's poor grades, his misbehavior, or some complaint about something the teacher had done to the child. She may have stated that the schools needed improvement but did not make specific suggestions. She tended more than mothers in any other group to respond with a "don't know" and some indication that she had not really thought about it, or that she did not think she could accomplish anything.

The Mothers' Educational Aspirations for the Child

We have presented evidence that working-class mothers feel a lack of personal effectiveness when dealing with the authority of the school system, while maintaining a high degree of respect for education as an important tool for achieving a better status in life. The frustration which must accompany these attitudes and beliefs was strikingly illustrated when mothers were asked about their aspirations and expectations for their children's educational achievement (reported in Table VIII-7).

TABLE VIII-7

Social Status Differences in Level of Mothers' Educational Aspirations and Expectations for their Children

Level	Percent of Mothers Responding at Each Level							
	Middle Class		Working Class					
			Skilled		Unskilled			
					Father Present		Father Absent	
	Asp.	Exp.	Asp.	Exp.	Asp.	Exp.	Asp.	Exp.
Graduate school	30	20	10	2	5	2	2	2
Finish college	62	65	67	40	56	13	44	24
Attend college	8	15	10	5	18	18	27	12
Vocational training after high school	0	0	0	0	0	0	0	0
Finish high school	0	0	14	45	20	51	27	56
Vocational training in high school	0	0	0	2	0	0	0	0
Some high school	0	0	0	2	0	5	0	2
Finish elementary school	0	0	0	0	0	8	0	2
Don't know	0	0	0	2	0	2	0	0
Mean Difference Between Aspiration and Expectation	0.4		1.4		1.8		1.0	
(standard deviation)	(0.49)		(1.61)		(1.55)		(1.36)	

The majority of mothers in all social class groups said that they would like their children to finish college. The majority of mothers in the unskilled working-class groups, however, when asked how far in school they thought their child would actually go, lowered their expectations to the level of completing high school. Skilled-working-class mothers' aspirations and expectations were more diverse, but the majority of those who aspired to a college education for their children also expected that their children would finish college. Discrepancy between expressed aspirations and expectations among middle-class mothers was minimal; they wanted their children to finish college, and they believed that they would.

Relationship Between Maternal Attitudes Toward School and Child's Performance

The focus of this study has been on the mother; because of this emphasis and because the children in the sample were all of preschool age, we can present no information on their adjustment to school or on their academic achievement. We do, however, have information on some of the skills which should be important in adapting to the new routine and to the demands of school. When Stanford-Binet intelligence tests were administered to these children, ratings were made on the 13 behaviors observable by an examiner during testing which are defined on the face sheet of the standard record booklet. These behaviors include attention, activity level, response to the adult examiner, and approaches to problem solving. Each child was rated on a scale from optimal through average to detrimental; each variable was expressed in bipolar terms as optimal and detrimental to test performance.

In an attempt to relate the mothers' attitudes about school to their children's performance, the association of maternal scores on the Educational Attitude Survey with ratings of the child's behavior during the Binet testing were examined; mother's chronological age, formal education, and verbal IQ (WAIS) were statistically controlled.

As evidenced in Table VII-8, partial correlations were significant at a five percent level of probability or better, for negative associations between the first educational attitudes factor, ES1 ("powerlessness"), and the child's initiatory behavior, quickness of response, social confidence, and self-assurance. Similarly, significant associations were obtained between the sixth educational attitudes factor, ES6 ("disparagement"), and initiatory behavior; the second educational attitudes factor, ES2 ("more traditional education"), was negatively associated with task-persistence and realistic response to failure.

Although such basic variables as mothers' intellectual level, amount of formal schooling, and age are significant predictors of the child's behavior in a task situation, when these variables are held constant, maternal attitudes toward education are significantly associated with the child's behavior.

A mother who expresses feelings of inadequacy in dealing with an authority or an institution is likely to have a child who is passively compliant and uncertain of his abilities in a task situation. Mothers who feel free to endorse statements critical of the educational institution are likely to have children who are actively responsive in the testing situation. And, to the extent that a mother endorses a traditional view of the nature of public education, her child is likely to give up easily and to react maladaptively to failure at a task.

Two additional items were examined in the same analysis: total viewing time and preference for complexity, both scores from the experimental measure of curiosity motivation described in Chapter VI. A positive maternal attitude toward education as a means to bettering one's life (ES3) was associated with lengthy viewing time; viewing time has been considered a measure of attentiveness and obedience to task instructions. The final educational attitudes factor was positively associated with preference for complex stimuli in the curiosity task. The mother's tendency to agree with statements criticizing the schools was significantly related to the child's tendency to prefer complex stimuli over more conventional or simple stimuli.

TABLE VIII-8

Relationships Between Maternal Attitudes and Children's Behavior during Testing*

Independent Variable	Dependent Variable (and d.f.)	Partial correlation (with mother's age, education, and IQ controlled)
	INITIATORY BEHAVIOR	
ES1	137	-.23
ES6	136	+.16
	QUICKNESS OF RESPONSE	
ES1	137	-.21
	SOCIAL CONFIDENCE	
ES1	137	-.18
	SELF-ASSURANCE	
ES1	137	-.20
	PERSISTENCE	
ES2	137	-.17
	RESPONSE TO FAILURE	
ES2	137	-.17
	VIEWING TIME	
ES3	149	+.23
	PREFERENCE FOR COMPLEXITY	
ES6	149	+.16

*All correlations are significant at $p \leq .05$ or better.

Another regression analysis examined the relationships between behavior during administration of the Binet and the child's cooperation and performance (use of correct labels) during the mother-child block sorting interaction. These relationships were significant at the .05 level or better, even with the effects of the major maternal variables (information processing, cognitive style, attitudes, and utilization of home resources scores) partialled out.

Maternal attitudes toward the school are significantly related to the child's performance and general behavior in a testing situation; that behavior in turn is related to the child's performance and cooperation in interaction with his mother. And these relationships are significant beyond those associations accounted for by maternal intelligence, demographic, and situation-specific factors.

Conclusion

The findings of this portion of the study were summarized at appropriate points in the chapter, and it is unnecessary to repeat them here. Two points, however, warrant emphasis. The first is that although mothers' attitudes toward education and school differed by socioeconomic status, there was great variety of attitudes expressed within each group, and there were types of attitudes or manners of expressing them which did not differ by social class. The second point is that it is not social class per se which determines the child's preparation and readiness for school, but the mother's conveyance of social-class related attitudes toward education and the school, and of expectations for her child's behavior. A mother's awareness of the reality of school as more than an educational institution with great authority, and her feelings of efficacy in relating to the representatives of such an impersonal and important social institution are among the basic factors important to the process of socializing her preschool child into the role of student; and they effectively predict school-related behaviors.

CHAPTER IX

SUMMARY OF PRESCHOOL PROJECT RESULTS

The Study of the Cognitive Environments of Urban Preschool Children was designed to examine the processes through which socioeconomic disadvantages affect the early cognitive development and educability of urban preschool Negro children. The project is not an intervention effort but an attempt to understand the processes linking social and cultural environments to the emerging capabilities of young children; it is expected that an understanding of these processes will assist in planning effective intervention programs.

In deciding to study the effects of disadvantaged social, cultural, and economic environments upon preschool children, we assumed that these effects are mediated in large part by the adults with whom the child most frequently interacts; for the young child, this typically is his mother. Thus the study focused on the mother's behavior and attitudes, especially those involving interactions with the preschool child; and mothers were viewed as teachers.

The major goals of the study were to analyze social class differences in terms of some specific elements of maternal behavior and environmental circumstances, in order to examine points of interaction between environment and child; and to identify and measure cognitive aspects of mother-child interaction, to identify maternal teaching styles, and to study their effects upon the child's cognitive behavior.

The research group consisted of mother-child pairs from three socioeconomic status levels: middle class, skilled working class, and unskilled working class; the unskilled working-class subjects were selected from both father-present and father-absent families. Data were gathered from an extensive interview in the home, examining family structure and circumstances, maternal attitudes toward education, availability and use of material resources in the home and community, maternal expectations about the child's behavior, and mother's use of language to convey ideas. Testing sessions at the University included administration of standard IQ tests to both mother and child, a conceptual sorting task to both, an experimental curiosity measure to the child, and measures of personality characteristics and problem-solving abilities to the mother. Mother and child were also observed in a structured interaction in which the mother was asked to teach the child a task she had just learned herself, and the pair was asked to cooperate in performing another task.

Educability: Cognitive Processes

Family Resources and Maternal Life Styles

Families from different social status levels differed as expected in size, structure, and utilization of resources. The working-class families in the sample were larger and lived under more crowded conditions than middle-class families. Physical and material resources are, of course, quantitatively poorer for working-class families, but utilization of available resources in the community was also different:

working-class mothers were involved in fewer out-of-home activities and made less use of such community facilities as the library and educational-recreational facilities.

Although no conclusive evidence could be found for differential effects of public vs. private housing, or father-presence vs. father-absence, the degree of crowding in the home does apparently influence maternal behavior (e.g., the type of strategy adopted to control the child). So also do the richness of utilization of home resources and the extent of the mother's interaction with the community. A relatively uncrowded home, active community participation, and fairly extensive use of home resources were related to the mother's tendency to see herself as an effective, active member of the community, and to the manner in which she interacted with her child. Mothers who felt more optimistic about their chances to improve their lives and less powerless with respect to the school also tended to put greater pressure for achievement on their children, to have a higher personal-subjective orientation, to monitor the child's response or anticipate his needs, and to engage the child's attention in positive ways. Their children manifested less problem behavior and performed better in both the semi-structured interaction and non-standard testing situations.

Maternal Control Strategies and Cognitive Processes

Attention was focused on types of control strategies, rather than the degree of restriction or regulation, used by the mother to guide behavior. Maternal responses to open-ended and semi-structured questions dealing with hypothetical situations involving their children were analyzed for the control maneuvers used. Social status differences were found in two control strategies, status-normative and personal-subjective: middle-class mothers tended to use a larger percentage of personal-subjective statements than did mothers in any of the three working-class groups. In addition, middle-class mothers tended to use more instructive statements (as opposed to imperatives) than did working-class mothers.

Social status differences in use of control strategies were highlighted by examining the relationship of control strategies to other variables: use of status-normative appeals was related to such family structure and orientation variables as low availability and use of home resources, crowding, and low community interaction. Failure to provide rationales and/or the tendency to use status and power as rationales were related to low maternal IQ and to relatively unelaborated language styles, as well as to poorer cognitive performance by the child. Use of rationales, especially of appeals based on the individual characteristics of persons and situations, was in turn related to rich home resources, better family circumstances, and better cognitive performance by both mother and child.

Mother-Child Interaction

The observed mother-child interaction provided data on maternal communication in a deliberate teaching situation. Each mother had the same information to communicate or the same goals to accomplish in cooperation with her child, but she was allowed complete freedom of time and method to implement these goals. The typescripts from these interactions were analyzed through a procedure measuring maternal ability to engage the child in the task and to present the relevant task information. Measures of cooperation and learning were obtained for the children in these interactions, and individual task responses were examined for evidence of certain maladaptive coping styles.

Mothers who taught most effectively used techniques helping the child to learn effectively while enjoying the task. Effective techniques included an initial attempt to picture the task positively and to interest the child in participating in it, presentation of concepts and information in sequences organized to promote efficient learning, use of specific language in labeling the task-relevant variables, frequent use of nonverbal focusing techniques directing the child's attention to appropriate stimuli, a high degree of specificity in pre-response instructions and post-response feedback which made cognitive processes operational, and a tendency to praise, encourage, and communicate expectations of success. In addition, the more successful mothers emphasized both verbal and physical responses when demanding feedback from their children.

In contrast to the sponsor-helper role assumed by the more successful mothers, mothers using other techniques often unwittingly cast themselves in taskmaster—authority figure roles. Attempts to interest the child in the task were usually inadequate or absent, so that many mothers relied solely upon coercion to obtain the child's cooperation. In the least effective teaching, the mother concentrated upon the performance of the nonverbal aspects of the task, nearly excluding verbalization of responses. That is, the mother would briefly demonstrate the task, usually with a minimum of orientation and specific explanation, and then require the child to perform the same actions himself. She would tend to rely on post-response feedback as her primary method of verbal teaching. Because of her poor organization and failure to give specific information, however, the child was usually unable to imitate successfully. Such interactions were characterized by repetitive sequences in which the child made errors in a recognizable pattern unrelated to the task-relevant stimulus characteristics, while the mother continued her attempts to teach solely or primarily through corrective feedback. Not surprisingly, these interactions became frustrating for both mother and child, and the children usually began to resist the task or to develop maladaptive coping styles geared toward avoidance of punishment rather than toward learning of the task material. Consequently, the result of the mother's failure to interest the child and help him understand the task was the child's failure at the immediate task. In addition, the child showed signs of self-defeating attitudes and habits that, if generalized, could have deleterious effects upon his cognitive development and educability.

The measures of mother and child behavior from the observed interactions tended to intercorrelate among themselves and with other variables from the project in a consistent pattern. There was a general tendency for a mother or child who scored toward either end on one of the interaction measures to have scored toward the same end on other interaction measures and on intelligence, language, educational and social background, control technique, cognitive style, and further measures from the interview and testing aspects of the project. Intercorrelation among measures was not, however, high enough to obscure the importance of single variables, and there was considerable intra-individual variability. In general, the data suggest that the differences observed among the mothers are not differences between two or more specific, identifiable teaching "styles," but instead may be conceptualized as differences in complex, multidimensional behavior ranging from the restricted, repetitive, and reactive to the more elaborate, varied, and proactive. Differences among groups of mothers were greatest, and were most closely associated to intelligence and social status, on measures of proactive behavior (behavior initiated by the mother relatively independent of the child's behavior or of obvious demands of the task). Consequently, the most pronounced differences occurred in the degree to which mothers attempted to motivate the child through presenting the task as an enjoyable experience, encouraging his efforts, and praising his success, the degree to which they provided orientation to the task before actually launching into it, and the degree to which they gave specific pre-response instructions describing the cognitive operations required of the child.

The interaction data further demonstrated the ineffectiveness of coercive control based on imperative demands and appeal to status differences. Mothers who confined themselves to coercion in attempts to eliminate undesirable behaviors were generally unsuccessful, since coercion tended to eliminate only overt resistance without changing the child's underlying lack of cooperation and interest. Successful control in interactions was more closely related to the mother's affective and information-giving behavior than it was to the strictness of her control behavior. That is, mothers who provided alternatives to simple compliance or negative prohibitions by stressing the benefits to be obtained from participation in the task and who provided help to the child in the form of specific, understandable, and useful information were more successful in obtaining the child's cooperation and interest.

Finally, although the data clearly imply that the teaching behavior of some mothers had deleterious effects upon the child, it is clear that the mothers neither intended nor wanted these effects. There is no evidence to suggest that the mothers who used poor techniques did so as a deliberate choice among alternatives. On the contrary, the repeated use of ineffective methods is seen as a direct result of repertoire limited by disadvantaged background. Although such mothers were acutely aware of their lack of progress in teaching the tasks to the child, they lacked the information and experience necessary to properly analyze and counteract it; thus, they perseverated with inadequate means.

Cognitive Behavior of Mother and Child

The child's ability to categorize was studied to assess his ability to use language as a cognitive tool. The data indicate that maternal teaching styles, reflecting the mother's information-processing strategies, techniques for controlling her child's behavior, and her attitudes toward education and the schools, are equal to or better than IQ and social class as predictors of the child's cognitive functioning. Differences in intellectual functioning were greater, on the whole, within socioeconomic groups than between groups.

Social status differences were found for both mothers and children on a conceptual style sorting task. Children from working-class homes appeared hindered in the discrimination and labeling processes required for classifying and showed attitudes that were less reflective. The mothers' ability to take an abstract attitude toward a task decreased with social status and was correlated with ineffective teaching in the structured interactions. Sexual differences also were found in the conceptual style sorting task: girls gave more nonscorable verbal responses, while boys gave more nonverbal ones. It was hypothesized that boys in lower-class urban Negro homes may receive less reinforcement for verbal behavior than do girls.

Additional measures of the child's ability to sort objects correctly and to verbalize the sorting principle were obtained from the structured interactions. Differences in performance were more sharply revealed in measures tapping abstract and categorical use of language than in those depending on denotative and labeling usage.

Mother's Language and the Child's Cognitive Behavior

Maternal language samples were obtained in several situations, including mother's response to projective materials and to semi-structured questions about the child, and mother's language to the interviewer and to the child. These speech samples were analyzed on a variety of linguistic scales. The major question to which this portion of the study addressed itself was whether there was any relationship between maternal language and children's cognitive ability. Multiple and partial correlation techniques were used to determine the influence of maternal and child IQ and of social status levels when the influence of maternal language variables was controlled. Social class and IQ appeared to be of only limited relevance in explaining the child's cognitive performance, although low IQ was the major predictor in the case of nonperformance or failure to respond meaningfully to a cognitive sorting task. Abstraction, a specific aspect of both language and cognitive style performance, appeared much more relevant; a strong relationship occurred between maternal language abstraction and the child's abstraction ability. This relationship was found primarily in the middle class, however, and suggests that there is an abstraction factor in the middle-class mother's language which may have far-reaching implications for the child's intellectual development. More generally, working-class mothers showed a picture of language restriction on research measures: when contrasted with middle-class mothers, lower-class mothers consistently spoke in shorter sentences, demonstrated a narrower range of linguistic ability and elaboration, exhibited a more constricted perceptual system in responding to semi-projective material, and evidenced deficiencies in elaboration of imaginative thought.

Educability: The Role of Pupil

A major construct described in this study was educability, or the readiness to perform in the school situation. The socialization model utilized in the study asserts that not only cognitive performance, but also the child's attitudes toward school and education, and his expectations of the role he will play as a pupil, are learned; they are modeled after the attitudes and expectations expressed by the mother in everyday interaction with institutions and with the child. Among the major maternal attitudes examined was a feeling of powerlessness that was expressed by working-class mothers in their attitudes toward the school, toward change in the school, and toward the mother-teacher relationship. Working-class mothers, in their description to their children of what school would be like, tended to emphasize the power structure and expectations for obedience, while middle-class mothers tended to add supportive statements, to view the first school experience as a psychological as well as physical encounter.

Partial correlation was used to examine the relative power of maternal attitudes toward education in predicting the child's behavior in a school-like situation, for example, taking a standard intelligence test. Basic variables such as mothers' IQ, amount of formal schooling, and age were significant predictors of the child's behavior in a task situation. When these variables were held constant, however, maternal attitudes such as powerlessness were significantly associated with the child's behavior: a mother who expressed feelings of powerlessness vis-a-vis institutional authority was likely to have a child who was passively compliant and uncertain of his abilities. Similarly, when the major maternal teaching variables were partialled out, maternal attitudes were significant predictors of the child's performance on the interaction tasks. Despite significant social class differences in maternal attitudes, there was great variability within any one social status group; it was concluded that the mother's conveying of positive attitudes toward education and school, and realistic expectations for the child's behavior, is more important than social class in determining the child's preparation and readiness for school. A mother's awareness of the school as more than an authoritative institution and her feelings of efficacy in relating to representatives of such an impersonal and important social institution are among the basic factors important to the process of socializing the preschool child into the role of pupil.

APPENDIX A

ITEMS ADMINISTERED DURING THE HOME INTERVIEW

The initial contact with subjects in the Cognitive Environments Study was made by trained social workers who visited the home for two interview sessions, averaging one and a half hours each, following a brief introductory visit. This appendix describes the questions asked and the procedures and categories used in evaluating and differentiating the subject-families on those items.

All questions asked in the home interview were directed to the mother; the emphasis was on her values and attitudes as well as on strictly physical and demographic description of the family and home. Following the interview, some evaluative ratings were made by the interviewer as well.

Contents of the Interview

A. OPEN END - INTERVIEWER'S RATINGS

1. Structure and setting of the interview
2. Interviewer/respondent interaction
3. Mother/child interaction
4. Family interaction
5. Mother's life style

B. DEMOGRAPHIC MATERIAL

1. Socioeconomic status
2. The family: size and membership
3. Marital status of four-year-old's parents
4. If the natural father is not presently living at home, has he lived there since the birth of the four-year-old?
5. Physical description of the home
6. Religious preference and activity
7. Mother's education
8. Father's education
9. Occupation and work history
10. Financial status

C. INFORMATION ON THE FOUR-YEAR-OLD CHILD

1. Sleeping patterns
2. Rating of child's clothing
3. Child's play areas
4. Child's toys and equipment
5. Reading material for the four-year-old child
6. Records for the four-year-old child
7. Intellectual games for the four-year-old child
8. Self-reliance and independence in the four-year-old child
9. Television viewing behaviors

D. MOTHER'S ATTITUDES, VALUES, AND ORIENTATIONS TOWARD SCHOOL AND JOB

1. Four-year-old child's preschool experience
2. Plans for four-year-old child's preschool experience
3. Plans for four-year-old child's kindergarten experience
4. Educational aspirations and expectations for the four-year-old
5. Occupational aspirations and expectations for the four-year-old
6. Mother's estimate of child's chances compared to hers
7. If a child is not doing well at school, who is at fault?
8. Things mother or child is doing to prepare him for school
9. Should a parent help a child with his homework?
10. Most important thing for child to consider in taking a job
11. Mother's estimate of child's class standing upon school entrance
12. Mother's attitudes and ideas about her own educationa and occupation
13. Educational Attitude Survey (see Appendix Q)

E. MOTHER/FAMILY ACTIVITIES AND LIVING PATTERNS

1. Typical Day (see Appendixes B and O)
2. Family's participation in organized activities
3. PTA involvement
4. Social activities and visiting
5. Classification of reading material for adults
6. Classification of records for adults
7. Classification of intellectual hobbies for adults
8. Classification of reading material for older children
9. Classification of records for older children
10. Classification of intellectual hobbies or games for older children
11. Family reading patterns
12. Utilization of library
13. What do you (mother) do if child asks a question you can't answer?
14. Television viewing behaviors
15. Radio listening behaviors
16. Celebration of holidays and anniversaries

A. OPEN END - INTERVIEWER'S RATINGS

1. Interview and setting

    a. Interview number

    b. Time of interview: from ______am/pm to ______am/pm

    c. Date of interview

    d. Place of interview

    e. Weather: fair, rain, snow, overcast

    f. Briefly describe the interaction and events leading up to the interview, and the setting

2. Interviewer/respondent interaction

    a. Describe interviewer/respondent interaction, feeling toward interview questions on part of respondent, etc. Evaluate.

b. Rating of mother's cooperation and openness with interviewer:

1= Very cooperative. Very involved in the interview; appeared relaxed and spontaneous with the interviewer; little or no evidence of defensiveness; volunteered personal information readily; showed interest in the purpose of the study; volunteered help in procuring other subjects.

2= Cooperative. Answered questions readily in a relaxed and open manner; spontaneous and relaxed with the interviewer; however, generally did not volunteer information that was not requested; may or may not have shown interest in the purpose of the study; did not show much interest in helping procure more subjects.

3= Slightly uncooperative. Generally answered questions readily, but may have shown some defensiveness; the respondent maintained her distance and did not allow the relationship to become too personal; may not have shown much interest in the purpose of the study; did not volunteer help in procuring other subjects.

4= Uncooperative. An underlying aura of resistance which may or may not have been expressed verbally; may have been manifested indirectly in the mother's reservation about giving time to the study and/or by a tenseness and defensiveness in answering the interviewer's questions; expressed little interest in the study; did not volunteer help in procuring other subjects.

5= Very uncooperative. Explicit verbalized resistance to the interview and/or interviewer; salient manifestation of insecurity and desire to make a good impression; showed no interest in the study; did not volunteer to help in procuring other subjects.

Note: if the mother's attitude toward the interviewer and the study changed as the interview progressed, base the evaluation upon the attitude manifested in the majority of the interview.

3. Mother/child interaction

a. Describe mother/subject (four-year-old child) interaction. Evaluate.

b. Rating of mother's affectionateness toward the child (Fels Parent Behavior Rating Scale 8.3 [Baldwin, Kalhorn, & Breese, 1949])--modal point: Rate the mother's expression of affection to the child personally. Does she manifest a warm, personal affection to the child, or a matter-of-fact, unemotional attitude, or definite antagonism? Evaluate her most typical behavior.

1= Passionate, consuming, intense, ardent, uncontrolled
2
3= Affectionate, warm, fondling, loving, expressive
4

5= Temperate, fond, attached, forgiving, kind
6
7= Objective, inhibited, neutral, matter-of-fact
8
9= Cool, aloof, distant, forbidding
10
11= Avoiding, annoyed, irritated, bothered
12
13= Hostile, rejecting, disliking, blaming, icy

c. Rating of mother's affectionateness toward the child--high point (same scale as above; rate "best" behavior--lowest scale point)

d. Rating of mother's affectionateness toward the child--low point (same scale as above; rate "worst" behavior--highest scale point)

e. Rating of support shown by mother:

1,2= Strong. Mother is able to accept and respond spontaneously to the child's dependence upon her: she gives good physical care; shows approval and affection; encourages learning efforts by sympathetic attention, praise, reassurance, demonstration; takes major responsibility for child care, but accepts and encourages father's participation; sets appropriate limits on child's behavior; takes responsibility for extension of learning opportunities; helps child expand his interests through creative toys, books, association with others; helps child know and accept responsibility as a member of the family.

3,4= Moderate. Mother is able to respond positively to most of the child's needs, but is unable to reach out spontaneously in meeting his needs: gives good physical care (child is fed and properly clothed); shows affection, but may not do so freely; concerned about child's learning efforts--gives time to helping him but may make inappropriate demands; may respond with some anxiety to child's lack of accomplishments; meager in extension of learning opportunities --may provide tools but may feel only fair amount of responsibility to participate.

5,6= Fair. Mother responds intellectually to child's needs, but is quite constrictive in her capacity to meet emotional needs: physical care is inconsistent; little or no demonstration of affection; may be over-protective or excessively permissive in dealing with child's behavior; greatly self-centered in her approach to child's learning efforts with restriction and disapproval, i.e., offers little encouragement, says "No", "Stop that", "That's not right"; uses argument rather than discussion to communicate with child; child is unable to experiment freely, mother may respond with rage.

7,8= Little. Mother's response to child's needs is competitive and meager: child is poorly clothed and fed; mother may be passive or unresponsive to child's efforts to learn;

shows little warmth; often regulates responsibility for care and intellectual stimulation to others, friends, neighbors, or other devices such as TV; few if any controls in matters of discipline, or mother may use punishment as a means of control.

f. Rating of mother's global achievement pressure:

This scale applies to the mother's behavior in training the child to achieve--to compete with standards of excellence by which success or failure is judged. In achievement training situations, the child's task is not merely to perform an action--simple obedience or conformity--but to perform it so as to meet the mother's imposed criterion or standard of excellence. The child must not merely do it, but do it *well*. If he succeeds in meeting the mother's standards, he is rewarded with praise and affection; if he fails, he is punished with rejection. Rate the mother according to:

1) The number and variety of situations in which the mother imposes standards of excellence. Does the child have to strive to meet her criteria in almost everything he does, or in just a few specific acts? Does the mother wait for development to occur spontaneously, or does she try to motivate the child to advance through effort?

2) The level of goals and expectations for the child. How much does she expect of her child? Is she pleased with any little accomplishment of the child, or is she satisfied only when he achieves things that few four-year-olds can do?

3) The degree of confidence of the mother that her child can indeed meet her standards of excellence, however high they may be. Are the standards she imposes seen as ideals, or does she fully expect the child to be able to meet them?

4) The degree to which the mother insists on self-reliance in the child. Is he expected to succeed through his own efforts, or does the mother reward dependency by helping him or doing things for him when he has difficulty?

5) The degree to which the mother holds the child responsible for his achievements (or lack of them). Does he succeed because of good work and fail because he didn't try hard enough, or is his success or failure attributed to factors beyond his control?

6) The mother's level of emotional involvement in the child's achievement. Does success in meeting the mother's standards bring the child high rewards in warmth, praise, and affection? Are these withheld when the child fails? Or are rewards and punishments unrelated to achievement situations? The highly involved mother is happy, pleased, and gratified when the child succeeds; depressed and disturbed when he doesn't. These feelings color her response to the child in achievement situations and act to reinforce his achievement striving. The uninvolved mother doesn't care much one way or the other about the child's success or failure. She reacts toward him in the same way regardless of his achievement.

Consider total behavior in making this rating. Are standards of excellence imposed in the areas of eating, dressing, creative play, speech, memory and recitation, reading and writing, physical skills, or self-care? In all these and more? Or in none?

1= Imposes extraordinary standards on the child in a wide variety of situations. Is constantantly pushing the child toward ever greater achievements. Expects him to be advanced far beyond the levels normally expected for four-year-olds. Acceptance or rejection of the child is closely connected with his success or failure by her criteria.

2= Imposes high standards in many different situations. Expects the child to be more advanced than most four-year-olds. Above average emotional involvement in the child's achievement. Tends to actively attempt to foster achievement in the child rather than to casually allow him to develop at his own pace.

3= Imposes standards of excellence in areas where the child can succeed fairly readily, but not when success would require great effort. Expectations and standards are sensitive to and isomorphic with the child's capacities. The mother wants the child to succeed, but she is not too disturbed if he doesn't.

4= Standards of excellence are restricted in range and low in level of expectation. Mother doesn't expect much of the child, and seems little concerned with his relative advancement. Sees him as unready to do very much on his own. Tends to reward dependent behavior and attention seeking.

5= Few if any standards of excellence. The mother babies the child, as if he were still an infant. Achievement is not expected, because "he's just a baby". Little or no attempt to advance the child.

g. Rating of mother's readiness of reinforcement (degree to which mother is vigilant or lax: Fels Parent Behavior Rating Scale 3.12 [Baldwin _et al_., 1949]). Rate the mother's tendency to enforce standards of conduct set up for the child. Does the mother follow up to see that the child conforms, or else sustains a penalty? Or are lapses in compliance disregarded? Disregard effectiveness of enforcement, and clarity to the child of standards involved.

1= Eternally vigilant. Goes out of the way to discover and discipline misconduct. Often pounces before lapse occurs.

2= Seldom lets child "get away with anything". Enforces rules strictly whenever violations come to attention, but seldom deliberately hunts for misbehavior.

3= Moderately firm. Strict about important requirements and prohibitions; but rather lax with minor violations, especially when they are not an issue at the moment.

4= Reluctant to enforce standards. Tends to overlook violations unless they are flagrant, cumulative, or threaten serious consequences.

5= Extremely lax. Disregards obvious misbehavior. Enforces regulations only when pressed by the strongest motives or most severe circumstances.

Note: "Enforcement" should not be equated with punishment. It applies not only to situations where the child has actively misbehaved, but also to situations where he has not done what the mother told him to do. The variable here is the degree to which the mother actively makes sure that the child conforms, in contrast to merely telling him to or expecting him to. The methods or severity of reinforcement are irrelevant.

4. Family interaction

a. Describe family interaction. Evaluate.

b. Family power structure:

1) Who makes most of the economic decisions in your family (e.g., major purchases, how much money should be spent, etc.)?
2) Who makes most of the social decisions in your family (e.g., leisure trips, vacations, entertainment)?
3) Who makes most of the household decisions in your family (e.g., care of the home, daily routine)?
4) Who makes most of the child-rearing decisions in your family (e.g., discipline, activities, education)?
5) If you and your husband are having an argument about something important, who usually wins?

Scale for all items:
1= Husband mostly
2= Both, but husband more
3= Both, but husband slightly more
4= Both equally
5= Both, but wife slightly more
6= Both, but wife more
7= Wife mostly
8= Other (specify)

5. Mother's life style

Describe the life style of this mother; indicate awareness of and ability to utilize resources available. Document.

B. DEMOGRAPHIC MATERIAL

1. Socioeconomic status

a. Social class
1= Upper-middle
2= Upper-lower
3= Lower-lower
4= Public Assistance

b. Housing
1= Private housing
2= Public housing

2. The family: size and membership

a. The four-year-old child
Sex:
1= male
2= female
Birth order:
_____ of _____ children
Relationship to mother:
1= natural
2= adopted
3= foster
Birthdate:
year, month, day

b. The mother
Age:
at last birthday, ______ years
Birthdate:
year, month, day
Place of birth:
1= Chicago
2= Midwest and Central States
3= Northeast
4= Northwest
5= Southeast
6= Southwest
7= South central
8= outside U.S.
Length of residence in Chicago:
1= less than 1 year
2= 1-2 years
3= 3-6 years
4= 7-11 years
5= 12-17 years
6= more than 17 years

c. The father: information as above for mother, plus:
Relationship to mother and child:
1= natural father
2= stepfather
3= common-law
4= other
5= no male in the home

d. Children in the home: beginning with the four-year-old subject, for each of the mother's natural children:
Sex: 1= male, 2= female
Age: last birthday, _____ years
Birthdate: year, month, day
Place of birth: 1-8= same as above for mother's place of birth

Last grade in school completed
School the child attended or now attending
Occupation or grade in school

e. Total number of mother's natural children

f. Other persons in the home (adults and children):
Relationship to mother and child
Sex: 1= male, 2= female
Age: last birthday, _____ years
Birthdate: year, month, day
Place of birth: 1-8= same as above for mother's place of birth
Last grade in school completed
School attended or now attending
Occupation or grade in school

g. Total number of children other than mother's natural children

h. Total number of adults other than parents

i. Total number of persons in the home

j. Ratio of children to adults (to 0.1)

3. Marital status of the four-year-old child's parents
1= married, living together
2= married, not living together
3= married, deserted and/or divorced
4= widowed
5= unmarried, living together
6= unmarried, not living together
7= unmarried, deserted and/or divorced

4. If the natural father is not presently living at home, has he lived there since the birth of the four-year-old?
1= yes
2= no
8= doesn't apply

5. The home

a. Dwelling type
1= house
2= conventional apartment
3= private converted apartment
4= shared or semi-private rooms or apartment
5= other

b. Number of rooms: half-rooms count as next highest whole number
00= missing data

c. Ratio of rooms to people (to 0.1)

d. List rooms, with description of how each is used

e. Rating of furnishings (consider quantity, quality, appropriateness):
1= superior
2= excellent

3= good
4= fair
5= poor
6= completely inadequate

f. Labor-saving devices working and available for mother's use within building with inside access (indicate for each: availability and adequacy):

Washing machine
Refrigerator
Vacuum cleaner
Electric dishwasher
Iron
Dryer
Freezer or compartment
Electric mixer
Blender
Ironing board
Other (specify)

g. Total number of labor-saving devices

h. Telephone present
1= yes
2= no

i. Number of cars
1= none
2= one
3= two or more

6. Religion

a. Mother's religious preference
1= Protestant
2= Catholic
3= Jewish
4= Other (specify)
5= None

b. Mother's frequency of church attendance
1= 4-7 times per week
2= 2-3 times per week
3= once a week
4= at least once a month
5= less than once a month
6= never
7= doesn't apply (e.g., dead)

c. Is mother a member of the church?
1= yes
2= no

d. Father's religious preference:
1-5= same as above for mother's preference
8= doesn't apply

e. Father's frequency of church attendance:
1-7= same as above for mother's attendance
8= doesn't apply

f. Is father a member of the church?
  1= yes
  2= no
  8= doesn't apply

g. Does the four-year-old child attend daily Bible school in the summer?
  1= yes
  2= no

h. Does the four-year-old child attend Sunday School?
  1= yes
  2= no

i. Does the four-year-old child participate in any other church activities for children?
  1= yes (specify)
  2= no

7. Mother's education

a. Mother has completed _____ years of academic schooling

b. Mother's training other than academic (technical training)
  1= none
  2= registered nurse
  3= business
  4= fine and applied arts
  5= medical assistant
  6= trade

c. Majority of mother's schooling completed in:
  1= Chicago
  2= Midwest and Central states
  3= Northeast
  4= Northwest
  5= Southeast
  6= Southwest
  7= South Central
  8= outside U.S.

d. Assessment of mother's reading ability
  1= reads with no difficulty
  2= reads with some difficulty
  3= reads with considerable difficulty
  4= reads not at all

8. Father's education (same as above for mother's education)

a. Father has completed ______ years of academic schooling

b. Father's training other than academic (technical training)

c. Majority of father's schooling completed in ______

9 Occupation and work history

a. Father's/Husband's occupation - status level
1= executive (large firm) or upper echelon professional
2= executive (small firm) or average type of professional work
3= supervisory work over white collar workers
4= supervision of manual workers; skilled white collar worker
5= skilled trades; semiskilled white collar worker
6= semiskilled manual worker
7= unskilled
8= doesn't apply

b. Is father/husband working now?
1= yes
2= no
8= doesn't apply

c. Where does he work and what does he do? (specify, describe in detail)

d. Is this work steady?
1= yes
2= no
8= doesn't apply

e. Salary per month or week (actual amount)

f. How long has father/husband been on present job?
1= less than one year
2= 1 to 2 years
3= 3 to 4 years
4= 5 to 6 years
5= 7 to 8 years
6= more than 8 years
7= doesn't apply; not working now

g. Since leaving school, father/husband has worked what per cent of time:
1= majority of the time
2= half time
3= less than half time
4= never
5= doesn't apply

h. Amount of time mother has worked since four-year-old child was born
1= not at all
2= in the child's third year
3= in the child's second year
4= in the child's third and second years
5= in the child's first year
6= in the child's second and first year

i. If mother worked, per cent of time per week
1= 0 to 2 hours
2= $\frac{1}{4}$ to 1/3 time
3= $\frac{1}{2}$ to 2/3 time
4= full time
8= doesn't apply

j. Type of work mother did - status level
1-7= same as above for father's occupational level
8= doesn't apply

k. Is mother working now?
1= yes
2= no

l. If mother worked, who took care of child (if more than one, code for lowest-numbered person)
1= father
2= grandmother
3= female relative(s)
4= male relative(s)
5= female sibling
6= male sibling
7= friend or neighbor
8= sitter
9= doesn't apply; don't know

10. Financial status

a. Annual family income
1= $20,000 or over
2= $19,999 - 15,000
3= $14,999 - 10,000
4= $9,999 - 7,000
5= $6,999 - 5,000
6= $4,999 - 3,000
7= $2,999 - 2,000
8= $1,999 - 1,000
9= $999 or less

b. Does the family receive assistance from:
Social security
Unemployment compensation
Other public assistance
1= yes
2= no

C. INFORMATION ON THE FOUR-YEAR-OLD CHILD

1. Sleeping patterns

a. Where does the child sleep?
1= in a bedroom
2= elsewhere (specify)

b. Number of people sleeping in room with child
1= 0
2= 1
3= 2
4= 3
5= 4
6= more than 4

c. Relationship of people sleeping in room with child
1= like-sexed siblings
2= siblings of the opposite sex
3= parents
4= siblings of both sexes
5= like-sexed siblings and parents
6= siblings of the opposite sex and parents
7= siblings of both sexes and parents
8= other
0= sleeps alone

d. Who sleeps in bed with child?
0-8= same as above for relationship of those sleeping in same room

2. Rating of child's clothing
1= excellent
2= adequate
3= inadequate
4= extremely inadequate

3. Child's play areas

a. Outside play area (include comments on condition)
1= large private yard
2= small private yard
3= large semi-private yard
4= small semi-private yard
5= open space available on grounds or building
6= public play lot or park within child's walking distance
7= vacant lot or space nearby
8= no outside play area available

b. Inside play area (include comments on condition)
1= large playroom or large area in own room
2= small playroom or adequate play area in other room
3= constricted play area within home
4= inadequate area; can only play in hallway, basement, or other public indoor area

4. Child's toys and equipment

a. Sandbox
1= present
2= none

b. Doll house, pool, tree house, play store, etc.
1= 4 or more
2= 3
3= 2
4= 1
5= none

d. Mobile toys (bike, trike, skates, wagon, auto, fire engine, etc.)
1-5= same as above for quantity of stationary gym equipment

e. Construction toys (tinker toys, blocks, beads, peg board, etc.)
   1= 5 or more
   2= 4
   3= 3
   4= 2
   5= 1
   6= none

f. Role-playing toys (dolls, animals, Indians, cowboys, cars, planes, play dishes, filling station, household toys, broom, telephone, stove, tools, doctor or nurse kit, etc.)
   1= 7 or more
   2= 6
   3= 5
   4= 4
   5= 3
   6= 2
   7= 1
   8= none

g. School-oriented toys (paper, pencils, blackboard, chalk, ABC color book, numbers, alphabet, letters, etc.)
   1-8= same as above for quantity of role-playing toys

h. Expressive toys (colored paper, scissors, crayons, color books, easel, paints, clay, playdough, mosaics and designs, sewing, leather stitching, musical instruments)
   1-8= same as above for quantity of role-playing toys

i. What type of toys does the child enjoy playing with most?
   1= sandbox or dollhouse
   2= gym equipment
   3= mobile toys
   4= construction toys
   5= role-playing toys
   6= school-oriented toys
   7= expressive toys
   8= role-playing plus either school-oriented or expressive

5. Reading material for the four-year-old child (enumerate)

a. Quantity
   1= much (10 or more pieces)
   2= some (6 to 10)
   3= few (1 to 5)
   4= none

b. Quality
   1= superior quality and variety
   2= excellent quality and good variety
   3= good quality and not as great variety
   4= poor quality but great variety
   5= poor quality and no variety
   6= doesn't apply, no books

c. Use of reading materials by four-year-old child
   1= extreme (much of each day)
   2= regular (at least once every day)
   3= often (several times a week)
   4= sometimes (at least once a week)
   5= seldom
   6= never

d. Use of reading materials by adult with child
   1-6= same as above for use of reading materials by child alone

e. How long was child read to yesterday?
   1= 2 hours or more
   2= $1\frac{1}{2}$ to 2 hours
   3= 1 to $1\frac{1}{2}$ hours
   4= 45 to 60 minutes
   5= 30 to 45 minutes
   6= 15 to 30 minutes
   7= up to 15 minutes
   8= not at all

6. Records for the four-year-old child (enumerate)

a. Quantity
   1= rich quantity (10 or more)
   2= adequate supply (6 to 10)
   3= few (1 to 5)
   4= none

b. Quality
   1= superior quality and variety
   2= excellent quality and good variety
   3= good quality and not as great variety
   4= poor quality but great variety
   5= poor quality and no variety
   6= doesn't apply, no records

c. Use of records by the four-year-old child
   1= extreme (much of each day)
   2= regular (at least once a day)
   3= often (several times a week)
   4= sometimes (at least once a week)
   5= seldom
   6= never

d. Use of records by adult with child
   1-6= same as above for use of records by child alone

7. Intellectual games for the four-year-old child (enumerate)

a. Quantity
   1= rich quantity
   2= adequate supply
   3= few
   4= none

b. Quality
    1= superior quality and variety
    2= excellent quality and good variety
    3= good quality and not as great variety
    4= poor quality but great variety
    5= poor quality and no variety
    6= doesn't apply, no intellectual-type games

c. Use of intellectual games by the four-year-old child
    1= extreme (much of each day)
    2= regular (at least once a day)
    3= often (several times a week)
    4= sometimes (at least once a week)
    5= seldom
    6= never

d. Use of intellectual games by adult with child:
    1-6= same as above for use of games by child alone

8. Self-reliance and independence in the four-year-old child

a. Self-reliance measures: Which of the following does the child regularly do on his own, without help from the mother?
    1= dress himself (except for tying shoes)
    2= get a drink of water or a snack
    3= use the toilet
    4= wash his hands
    5= perform small household tasks

b. Number of self-reliance measures checked
    0-5= actual number of items checked by mother

c. Interviewer's rating of the mother's attitude toward self-reliance in her child
    1= demands
    2= encourages
    3= allows
    4= discourages
    5= forbids

d. Can the child play unsupervised without the mother being present or with only an occasional check (once an hour or less)?
    1= yes
    2= no

e. To what extent does the mother allow the child to play with other children, without her being present?
    0= not allowed
    1= with siblings or cousins only
    2= with immediate neighbors, known to mother
    3= with any children on the block

f. To what extent does the mother allow the child to play outside the home without her being present?
    1= on his porch or in the yard only
    2= at a neighbor's house
    3= anywhere on the block
    4= beyond the block or at parks and playgrounds

g. Interviewer's rating of mother's attitude toward independence in play

1= demands
2= encourages
3= allows
4= discourages
5= forbids

9. Television habits

a. Number of hours child watches television daily

1= 0 to ! hour
2= 1 to 2 hours
3= 2 to 3 hours
4= 3 to 4 hours
5= 4 to 5 hours
6= 5 to 6 hours
7= more than 6 hours

b. TV show child likes best - first choice

1= educational (Discovery, etc.)
2= children's variety (Captain Kangaroo)
3= comedy and family situation
4= game-type show
5= cartoons
6= mystery and adventure series (westerns)
7= musical and adult variety shows
8= daytime serials

c. TV show child likes best - second choice

1-8= same as above for first choice

d. TV show child likes best - third choice

1-8= same as above for first choice

D. MOTHER'S ATTITUDES, VALUES, AND ORIENTATIONS TOWARD SCHOOL AND JOB

1. Four-year-old child's preschool experience

a. Is N______ (four-year-old child) in nursery school (or preschool) now?

1= yes
2= no

b. Is N______ in a day care center now?

1= yes
2= no

c. If yes, how much time per day

1= half-day
2= full day

d. If yes, how many days per week

1-6= actual number of days per week

2. Plans for four-year-old child's preschool experience

   a. Do you plan to send N______ to nursery school (or preschool) before he goes to public school?
      1= yes
      2= maybe
      3= no

   b. If yes, how much time per day?
      1= half-day
      2= full day

   c. If yes, how many days per week?
      1-6= actual number of days per week

   d. Why have you decided (to send, not to send) N______ to nursery school?

3. Plans for four-year-old child's kindergarten attendance

   a. Do you plan to send N______ to kindergarten?
      1= yes
      2= undecided
      3= no

   b. Why do you (plan or not plan or are undecided) to send N______ to kindergarten?

4. Educational aspirations and expectations for the four-year-old child

   a. How far in school would you like for N______ to go?
      1= go to graduate school, professional school
      2= finish college
      3= go to college
      4= take vocational work after high school
      5= finish high school
      6= take vocational work in high school
      7= attend some high school (academic courses)
      8= finish elementary school, or less
      9= don't know

   b. I just asked you how far you would like for N______ to go in school. Thinking about it now, how far do you think N______ will probably actually go in school?
      1-9= same as above

   c. Difference between mother's aspiration and expectation
      0-8= absolute difference between aspiration and expectation

5. Occupational aspirations and expectations for the four-year-old child

   a. If you could have your wish, what would you like N______ to do or be prepared to do for a living when he grows up? (Probe if subject responds "Don't know". Ascertain whether subject is optimistic or pessimistic re: eventual outcome)
      0= no scorable response
      1= professional (post-graduate training)
      2= jobs requiring college (or mention of some school after finishing high school)

3= semi-professional (post—high school training: nurse, dental assistant)
4= artistic occupation (musician, artist)
5= clerical and sales (secretary, clerk)
6= jobs requiring high school diploma (though mother may not mention that fact)
7= skilled trades
8= semiskilled, unskilled labor
9= housewife

b. Again, things don't turn out just the way we wish for them; what is your best guess as to what N______ will actually be prepared to do when he grows up? (Probe if subject responds "Don't know". Ascertain subject's private hopes for child--are they optimistic or pessimistic?)
1-9= same as above

c. Difference between mother's aspiration and expectation
0-8= absolute difference between aspiration and expectation

6. Mother's estimate of child's chances compared to hers

a. Compared to when you and your husband were young, what kind of a chance do you think N______ has to get a good education?
1= a great deal better
2= a little better
3= the same
4= a little worse
5= a great deal worse

b. What kind of chance do you think N______ has to get a job?
1-5= same as above

c. Why do you think N______ has (a better, a worse, or the same) chance for a good job and education (than/that) you and his father had?

7. If a child is not doing well at school, who is at fault?
0= no one
1= school
2= teacher
3= child
4= parent
5= combination of 1 (or 1 and 2) plus 3
6= combination of 1 (or 1 and 2) plus 4
7= 3 plus 4
8= all
9= don't know

8. Are there any particular things you are doing now with N______ or that he is doing that you think may help him when he gets to school? (Probe for concrete specific actions.)
1= social skills
2= attitudes
3= nursery school
4= academic skills

5= social and academic skills; or social and academic skills plus attitudes
6= attitudes plus academic skills
7= attitudes plus social skills
8= attitudes and nursery school; or academic skills and nursery school
9= nothing
0= no information

9. Do you think a parent should help a child with his homework?
1= yes, parent should do the work for the child if it is too difficult for the child
2= yes, parent should go over what the child has to do and see that he understands and does the work; parent should give all the help the child needs
3= yes, but only to see that the child does his work
4= yes, but parent should help only when the child asks for a particular explanation
5= no, parent should not help even if the child asks
6= other response (specify)

If mother answered no, ask why.

10. Which of these do you think should be most important for N_____ to consider in taking a job after he finishes school? (If mother says "Enjoyment", ask for most important factor assuming choice is among equally well-liked jobs. Allow mother only one answer.)
1= security (one he can always keep)
2= one that pays well
3= one that offers good chance for advancement
4= one where he would learn a lot

11. Mother's estimate of child's class standing upon school entrance
(Mother was shown a diagram of ten stick figures in a row, the one to her left labeled "Very Best" and the one to her right "Very Poorest".) This is a diagram showing children in school. These are doing the very best work. These are doing the very poorest work. Now I would like for you to circle a figure representing the position you think N_____ will occupy when he first enters school. This is the very highest (indicate left figure) and this is the very lowest (indicate right figure). Where do you think N_____ will be on this scale?
01= first in class
02= second in class
03-10= third in class through last in class

12. Mother's attitudes and ideas about her own education and occupation

a. Termination of mother's education: "The reason you stopped school when you did was because _________." (Record verbatim and then code appropriately.)
1= graduated
2= had to go to work to support self
3= had to go to work to support family

4= was no longer interested in school and wanted to earn money
5= could get a good job with amount of school already completed
6= to get married
7= pregnant
8= was failing subjects
9= other reason (specify)

b. If you had it to do over again knowing what you know now, would you have left school when you did?
1= yes
2= no

c. If no, how much further in school would you go now if you had it to do over again?
1-8= same as educational aspirations for four-year-old
9= other (specify)

d. Have you ever taken any classes of any kind since you left school?
1= yes
2= no

e. If yes, what courses has mother taken since leaving school
(1= none)
2= academic (specify: finish grade school, high school courses, finish high school, college courses, finish college, graduate work, finish graduate degree, etc.)
3= nonacademic (specify: vocational or special interest such as cooking, sewing, marketing, crafts, etc.)
4= both academic and nonacademic (specify)

f. (If mother has taken courses since leaving school:) What made you think of going back to school?

g. If things continue as they are, do you think that you will have ________ to improve your life?
1= many opportunities
2= some opportunities
3= few opportunities
4= no opportunities

h. If you had the power to do as you wished about education in the schools, what would you do?
Code 1= present, 2= absent for each type of suggestion:
academics or curriculum
physical plant or mechanics of school administration
discipline
teachers (quality)
social/political concerns and action (including changes in upper-level administration)
general or vague response
personal (no "power" necessary--e.g., joining PTA)
no change necessary
no suggestion

i. Would you prefer an office job with a smaller salary or a factory job with a larger salary?
1= office
2= factory

j. The things I learned in school did not help me when I got out.
1= strongly agree
2= agree
3= undecided
4= disagree
5= strongly disagree

k. I would rather work than go to school, even if I didn't need the money.
1-5= same as above

l. How well did you like school?
1= very much
2= fairly well
3= didn't care much one way or the other
4= didn't like it very much
5= didn't like it at all

m. Who influenced your (response to above) most?
1= father
2= mother
3= brothers or sisters
4= other relatives (specify)
5= school friends
6= teachers
7= others (specify)
8= nobody

n. What subjects did you like best in school?
(For best-liked and least-liked subjects, record specific title of courses, to facilitate later coding of subject areas.)

o. What subjects did you like least in school?
(Record specific title of courses.)

13. Educational Attitude Survey
(See Appendix Q.)

a. Do you have other children in school?
1= yes
2= no

b. Do you plan to send N______ to a:
1= public school
2= religious school
3= private (nonreligious) school
4= other type of school (specify)

c. Name and Address of school

E. MOTHER/FAMILY ACTIVITIES AND LIVING PATTERNS

1. Typical Day
   (See Appendixes B and O)

2. Family's participation in organized activities

For this section of the interview, the mother was asked about her family's involvement in organizations, classified according to major purposes rather than by name or meeting place. A group is defined as having regular meetings and/or bulletins, etc.

When asking the mother about her family's participation in organized groups, distinctions are made between those to which she herself belongs, those to which her husband belongs, and those to which the older children belong.

Summary sheets for mother's activities and for father's activities were used to rate the degree of involvement of each parent in each different type of group asked about. In addition, sheets for each (mother and father) were used to list the name, activities or purpose, and degree of parents' involvement for each specific group within the general categories used by the interviewer. All information was obtained from the mother.

We would like to know which groups you, your husband, and older children are interested in.

I. Do you, your husband, or older children belong to any church-related groups?
   (Examples: social church groups, women's auxiliary, men's brotherhood, guilds, religious fraternal orders, fund-raising groups, choir)

II. Do you belong to any political organizations?
   (Examples: Independent Voters of Illinois, League of Women Voters, Young Democrats or Republicans, Regular Democratic or Republican Party, independent political groups such as SANE, Student Peace Union, etc.)

III. Do you belong to any social action groups?
   (Examples: TWO, CORE, NAACP, etc.)

IV. Do you belong to any school-related groups?
   (Examples: those formally associated with the school such as PTA, Mother's Club, PTO, Alumni Association, etc.; or those informally associated with the school such as educational associations concerned with improving the school, general education, specific curriculum, etc.)

V. Do you belong to any self-education groups?
   (Examples: Great Books Course, adult education courses, Bible classes, study or discussion groups that meet regularly, Delphia, arts and crafts classes)

VI. Do you belong to any community-oriented groups?
   (Examples: nationally sponsored, administratively active in groups such as YMCA, YWCA, Girl or Boy Scouts, B'nai B'rith; or locally sponsored charity boards, city club, neighborhood improvement groups)

VII. Do you belong to any work organizations?
(Examples: formally organized professional or union organizations; work-derived social and recreational groups, such as bowling league, baseball team, choir, bridge club)

VIII. Do you belong to any patriotic or military groups?
(Examples: VFW, American Legion, Jewish War Veterans, DAR)

IX. Do you belong to any social groups?
(Examples: formally organized fraternal or private invitational social clubs; or informally organized card playing clubs, special interest or hobby groups, neighborhood clubs, cousins' clubs, family clubs, community or institution sponsored clubs)

X. Do you belong to any other groups?

Summary of mother's/father's activities

a. For each of the ten above:
1= Very active. Acts on committees, holds or has held office, attends meetings regularly, high interest.
2= Active. Attends meetings fairly regularly, sometimes helps out actively, is interested.
3= Member. Intermittent attendance, does not help actively, retains slight interest in group.
4= Non-member. Does not belong, but sometimes attends meetings or retains some interest.
5= Not involved in such groups.

b. Total number of activities (groups), counting each specific organization within the general categories
1-7= actual number
8= eight or more

c. Total involvement
1= very active
2= active
3= member
4= not member but attends some meetings
5= no active participation in any organizations

3. PTA

a. If the school your (four-year-old) child attends has a PTA, would you join?
1= yes
2= no
3= maybe

b. Would you attend meetings regularly?
1-3= same as above

c. If the PTA were having an affair and you were asked to do a job you could do at home, like bake a cake or something, would you do it?
1-3= same as above

d. If you were asked to help out at a candy booth at one PTA affair, would you do it?
1-3= same as above

e. If you were asked to be chairman or organize a refreshment committee at one affair, would you do it?
1-3= same as above

f. If you were asked to accept some permanent office in the PTA for a year, would you do it?
1-3= same as above

g. Code for highest category with affirmative answer
1-6= category a through category f

4. Social activities and visiting

a. When you get together with your friends, where do you usually go? (Record only first two responses, indicating first and second choice.)
0= nowhere
1= ballet, theater, opera, concerts
2= clubs, lodges, church activities
3= nightclubs, restaurants
4= category other than those listed here (specify)
5= sports events
6= movies
7= one of our homes, parties
8= bars, taverns

b. How often do you visit (pass the time of day) with or stop and talk with the people who live within a few blocks of you?
1= almost every day
2= a few times a week
3= once in a while
4= almost never; never

c. Are these:
1= almost all relatives
2= friends
3= both friends and relatives equally
0= no visiting

d. About how much time would you say you spend each week visiting people at home or having somebody visit you?
1= more than 20 hours
2= 15 to 20 hours
3= 10 to 15 hours
4= 7 to 10 hours
5= 5 to 7 hours
6= 3 to 5 hours
7= 2 to 3 hours
8= 1 hour or more
9= 0 hours

5. Classification of reading material for adults

a. Quantity of reading material for adults
1= many
2= adequate supply
3= few
4= no reading material for adults

b Quality of reading material for adults (list examples)
1= superior quality and variety
2= excellent quality and good variety
3= good quality and not so good variety
4= poor quality but great variety
5= poor quality and no variety
8= doesn't apply; no reading material

c. Use of reading material by adults
1= extreme (much of each day)
2= regularly (at least once every day)
3= often (several times a week)
4= sometimes (at least once a week)
5= seldom (less than once a week)
6= never

6. Classification of records for adults

a. Quantity of records for adults
1-4= same as above for quantity of reading material

b. Quality of records for adults (list examples)
1-5,8= same as above for quality of reading material

c. Use of records by adults
1-6= same as above for use of reading material

7. Classification of intellectual hobbies for adults

a. Quantity of intellectual hobbies for adults (list examples)
1= many (4 or more)
2= adequate (2 or 3)
3= few (1)
4= none

b. Use of intellectual hobbies by adults
1-6= same as above for use of reading material

8. Classification of reading material for older children (when applicable)

a. Quantity
1-4= same as above for adult reading material

b. Quality (list examples)
1-5= same as above for adult reading material
8= not applicable

c. Use
1-6= same as above for adult reading material

9. Classification of records for older children (when applicable)

  a. Quantity
    1-4= same as above for adult reading material
    8= not applicable

  b. Quality (list examples)
    1-5,8= same as above for adult reading material

  c. Use
    1-6= same as above for adult reading material
    8= not applicable

10. Classification of intellectual hobbies or games for older children (when applicable)

  a. Quantity (list examples)
    1-4= same as above for adult intellectual hobbies

  b. Use
    1-6= same as above for adult reading material

11. Family reading patterns

  a. Do you (mother) generally find things out by reading the newspapers, listening to the radio or TV, or by talking to friends? (Record first, second, and third choice.)
    1= newspapers
    2= TV
    3= radio
    4= magazines
    5= friends
    6= other (specify)

  b. Some people enjoy reading a magazine or book when they have a few minutes, while others are not too interested in reading. Do you (mother) read any magazines regularly (at least every other issue)?
    1= yes
    2= no

  c. Number of magazines read regularly by mother
    0= none
    1-7= actual number
    8= 8 or more

  d. If mother reads magazines regularly, which ones? (List names of magazines)
    1= news
    2= home
    3= romance
    4= sports and mechanics
    5= 1 and 2; or 1, 2, and 3; or 1, 2, and 4
    6= 1 and 3; or 1 and 4
    7= 2 and 3; or 2 and 4
    8= 3 and 4
    0= none

e. In the last month or so, have you read anything in books?
    1= yes
    2= no
  In magazines?
    1-2= same as above
  In newspapers?
    1-2= same as above
  In pamphlets?
    1-2= same as above
  Others?
    1-2= same as above

  Types of material mother read in the last month
    1= books and four other categories
    2= books and three other categories
    3= books and two other categories
    4= no books, but at least two other categories
    5= books only
    6= magazines or pamphlets
    7= newspapers
    8= none

f. What kinds of books do you like best? Do you prefer love stories, biographies, books on how to do things, stories of family life, books of adventure, or something else?
  (Record only first two responses and indicate relative preference.)
    1= academic subjects
    2= biography
    3= "how to do"
    4= love and romance
    5= family life
    6= adventure
    7= mystery
    8= other (specify)

12. Library utilization

a. Where is your nearest library?
    1= mother knows library location
    2= mother does not know

b. Do you (mother) have a library card?
    1= yes
    2= no

c. Do you ever go to the library?
    1= yes
    2= no
  If yes, how often?
    1= once a week
    2= once every two weeks
    3= once a month
    4= once every six months
    5= once a year
    6= less than once a year
    0= never

d. About how many books do you usually get for yourself?
 0-6= actual number
 7= 7 or more
 8= doesn't go or doesn't apply
 9= has no card, but goes to library

e. About how many books do you usually get for the children?
 0-9= same as above

f. Do the older children have library cards?
 1= yes
 2= no
 8= not applicable

13. What do you do if N______ asks a question that you can't answer?
 1= look it up with him; or tell him "don't know" and look it up with him
 2= look it up for him; or tell him "don't know" and look it up for him
 3= send him to someone else; or ask someone else for him; or tell him "don't know" and send him to or ask someome else
 4= just tell him "don't know"
 5= answer as best can; or tell him "don't know" but answer as best can
 6= change the subject; ignore him; or tell him "don't know" and change the subject or ignore him
 7= combination or two or more (#1 through #5)
 8= combination of two or more (#4 through #6)

14. Television viewing behaviors

a. The following is a list of television programs. We would like to know how often N______ watches these programs and how often you watch them.

For each of 39 network and local shows, mother and child's viewing was scored separately.
 1= almost always
 2= often
 3= sometimes
 4= almost never

b. Which five shows do you enjoy watching most?
(List names of the five shows, from first to fifth choice, along with the time of day and day of the week the show is on.)

c. Which five shows does N______ enjoy watching most?
(same as above for mother's favorite programs)

d. TV shows mother enjoys watching most
(separately for first, second, and third choice)
 1= daytime serials
 2= game-type shows
 3= women's variety
 4= comedy and family situation
 5= movies
 6= news, documentary, talk
 7= educational
 8= musical and variety
 9= drama and adventure

e TV shows child enjoys most
(see section C Information on the Four-Year-Old Child)

f Is television in home operating?
1= yes
2= no

g Number of sets
1-3= actual number
4= more than three
5= none

h Where are sets located? (list specific locations)

i About how many hours a day do you watch TV?
0-6= actual number of hours
7= 7 or more hours
8= doesn't apply, has no TV, or set is broken

j How many hours a day does N______ watch TV?
(see section C.: Information on the Four-Year-Old Child)

k Do you ever watch (the local educational television channel)?
1= yes
2= no
8= doesn't apply

l. If yes, what programs do you recall having watched within the last two weeks? (list names of programs)

15 Radio listening behaviors

a What hours during the day do you usually have your radio on?
(list, from _____am/pm to ______am/pm)

b Number of hours per day mother listens to radio
0-6= actual number of hours
7= 7 or more hours
8= doesn't apply

c What stations do you usually have tuned in on the radio
(List first, second, and third choice, by name of station, and indicate whether each is FM or AM.)

d Preferred radio station
1= AM
2= FM
3= both
4= none
8= doesn't apply

16. Celebrations of holidays and anniversaries
For each of the following list of holidays and anniversaries, describe family's activities and children's participation in both preparation and celebration
1= family does not celebrate
2= family celebrates, but mother gives no details or
family celebrates at home
3= family celebrates out, no details or unclear

4= celebrated by immediate family, no other details or unclear
5= immediate family celebrates at home
6= immediate family celebrates out
7= extended family and/or friends included in celebration, no detail
8= extended family and/or friends included in celebration at home
9= extended family and/or friends included in celebration, out
0= (for anniversaries only) not married

a. Thanksgiving

b. Christmas

c. New Year's

d. Labor Day

e. Birthdays

f. Memorial Day

g. Fourth of July

h. Anniversaries

APPENDIX B

ADMINISTERING AND SCORING HOME RESOURCES PATTERNS*

The home resources patterns and scale described in this appendix were used to assess the degree to which the home provides a variety of objects, experiences, and attitudes relevant to the educability of the preschool child.

"Resources" refers to objects, events, and persons which are available in the home environment and which function to provide experience and information and to stimulate the development of skills and attitudes in the four-year-old child; specifically, the criterion of resourcefulness here is the impact or value of the resource for the young child's educability. "Educability" in turn refers to the child's readiness for school. Readiness for school, however, does not imply merely the existence of skills required for entrance into school, but the attitudes toward learning and a variety of experiences with persons and events which allow ease of adjustment to the role of pupil in relation to teacher, institution, and peers.

Operationally, home resources refer primarily to mothers' responses to questions and interviewers' descriptions and evaluations of home and family, all obtained during interview sessions held with the mother in the home. A lengthy list of interview items was clustered to describe nine categories or patterns of home resources: physical space, physical movement, physical appearance and care, play, work-orientation, direct learning, indirect learning, direct social contacts, and indirect social contacts. Direct social status indicators such as income, father's occupation, and parents' education, were excluded from the sources of information. In each instance, a rating from low to high availability and utilization of resources is made not merely according to presence or utilization of the appropriate objects, events, and orientations, but also on the basis of the relevance and applicability of family resources to the young child's developing skills and attitudes.

Procedure

Sources of Information for the Ratings

Appropriate items from the home interviews were examined for information pertinent to each resource pattern. Some items pertained to more than one pattern; for example, the mother's description of "yesterday's" activities was used throughout to obtain information on the various patterns. The items used to assess home resources, and the response categories for each, are given below. Responses to items for which no response categories are listed were recorded verbatim and either scored later or used for qualitative distinctions in making the ratings of home resources.

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*The major portion of this appendix was prepared by Miss Georgianne Baker (Assistant Home Economist, Instituto InterAmericano de Ciencias Agricolos de la OEA, Turrialba, Costa Rica), who was primarily responsible for constructing the Home Resources Patterns scales, and for scoring the families in the study.

Interviewer's description of the setting in which the interview occurred: home and neighborhood surroundings.

Ratio of rooms to people in the home

Number of available labor-saving devices and condition or adequacy of each
(washing machine, dryer, refrigerator, freezer or compartment, vacuum cleaner, electric mixer, electric dishwasher, blender, iron, ironing board, telephone, others specified by interviewer)

Rating of furnishings, considering quantity, quality, and appropriateness
(superior; excellent; good; fair; poor; or completely inadequate)

Sleeping arrangements for the four-year-old child:
- Does sleep in a bedroom or elsewhere (specify)?
- How many people sleep in the room with the child?
- Who sleeps in the room with the child?
  - (like-sexed siblings; siblings of the opposite sex; parents; siblings of both sexes; some combination of these; others; or child sleeps alone)
- Who sleeps in bed with the child?
  - (same categories as above for who sleeps in room)

Inside play area and its condition
(large playroom or large area in own room; small play room or adequate area in another room; constricted play area within home; or inadequate area such as hallway or basement or other public area)

Outside play area and its condition
(large private yard; small private yard; large semi-private yard; small semi-private yard; open space on grounds; public play lot or park within child's walking distance; vacant lot nearby; or no outside play area available within child's walking distance)

Outdoor toys and equipment: number of items of each type
(sandbox, dollhouse, pool, tree house, play store, etc.; stationary gym equipment such as jungle gym or swings; mobile toys such as tricycle, skates, wagon)

Indoor toys and equipment: number of items of each type
(construction toys such as blocks, tinker toys, beads, peg board; role-playing toys such as dolls, animals, cars,

planes, dishes, tools, doctor kit; school-oriented toys such as paper and pencils, blackboard, ABC's, numbers; expressive toys such as colored paper, scissors, crayons, paints, clay, musical instruments)

Use of toys and equipment: for each of the outdoor and indoor types listed above
(extreme [much of each day]; regular [at least once each day]; often [several times a week]; sometimes [at least once a week]; seldom; never)

What type of toys does the child enjoy playing with most?

Toy-substitues provided by mother: specify, e.g., pots and pans for musical instruments

Extent of child's unsupervised play (mother not present, checks on child once an hour or less) with other children
(not allowed; with siblings or cousins only; with immediate neighbors known to mother; or with any children on the block)

Extent of child's unsupervised play (as above) outside the home
(on his porch or in the yard only; at a neighbor's house; anywhere on the block; or beyond the block at public parks or playgrounds)

Mother's attitude toward child's independence in play
(demands; encourages; allows; discourages; forbids)

Extent and frequency of television viewing by mother and child
For each of 39 local and network programs, mother was asked to indicate how often the child watched the show and how often she watched it.
(almost always; often; sometimes; never)

Television viewing preferences
Mother was asked to list the five shows she enjoyed most, and the five shows the four-year-old child enjoyed most. The name of each program was recorded, with the day of the week and the time it was on.

Number of hours child watches television per day
(less than one hour; 1-2 hours; 2-3 hours; 3-4 hours; 4-5 hours; 5-6 hours; more than 6 hours)

Does mother ever turn on the local educational television channel?

If mother watches educational television, what programs does she recall having watched on that station during the previous two weeks?

Hours during the day when the radio is usually on

Stations usually tuned in on the radio (mother's first, second, and third choice, specifying AM or FM)

Typical Day

"Now, Mrs. ______, I would like for you to tell me in as much detail [illegible] possible about your activities and those of your family yesterday. We have found that we can learn a great deal about what our four-year-olds are like and what they like to do if we follow them closely for one whole day. We know that every child and every household is different. We hope that you will feel free to tell us in your own way about your activities and those of the family as you lived together yesterday.

"I know that it is often difficult to recall everything we do. I will attempt to help you by asking questions at intervals (from time to time) if it becomes a little difficult. We want to get a complete picture of the whole day--from the time you and (four-year-old child) got up until bedtime. You may have questions; I will be glad to answer any that I can."

Suitable probing questions were used by the interviewer to obtain a full account of the day's activities, to fill in gaps left in the mother's narrative, and to inquire about areas she might overlook.

The entire response was tape-recorded, and later transcribed; typed verbatim responses were used for scoring the home resources patterns.

Rating of child's clothing
(excellent; adequate; inadequate; extremely inadequate)

Self-reliance: which of the following does the child regularly do on his own, without help from mother
(dress himself [except for tying shoes]; get a drink of water or a snack; use the toilet; wash his hands; perform small household tasks)

Rating of mother's attitude toward self-reliance
(demands; encourages; allows; discourages; prevents)

Mother's attitude toward child's behavior leading to mastery

Mothers were asked to respond to nine hypothetical situations in which the child's behavior in the course of mastering skills came into conflict with the environment. Tape-recorded responses were transcribed verbatim for scoring. Five of the nine items were used as sources of information for rating the home resources patterns.

"What would you do if (four-year-old child) was trying to learn to sweep and accidentally broke something of value?"

"What would you do if ______ spilled soup all over while attempting to feed himself?"

"What would you do if you had ______ in a supermarket, and he kept running around pointing out things on the shelves so that your shopping was slowed up and he was getting in the way of other shoppers?"

"What would you do if ______ was trying to paint a picture and accidentally splashed paint all over a nearby chair which had a clean slip cover on it (or a new rug you had just gotten for your living room)?"

"What would you do if you found ______ taking a good clock apart so that he could see what made it tick and he either broke or lost some of the pieces?"

Quantity of reading material for the child
(much [10 or more books]; some [6 to 10]; few [1 to 5]; none)

Quality of reading material for the child
(superior quality and variety; excellent quality and good variety; good quality but not as great variety; poor quality but great variety; poor quality and no variety; doesn't apply, no books)

Use of reading material by the child
(same categories as above for use of toys and equipment)

Use of reading material by adult with child
(same categories as above for use of toys and equipment)

How long was the child read to yesterday?
(2 hours or more; $1\frac{1}{2}$ to 2 hours; $1-1\frac{1}{2}$ hours; 45-60 minutes; 30-45 minutes; 15-30 minutes; up to 15 minutes; not at all)

Quantity of records for the four-year-old child
(same categories as above for reading material)

Quality of records for the four-year-old child
(same categories as above for reading material)

Use of records by the child
(same categories as above for reading material)

Use of records by adult with child
(same categories as above for reading material)

Quantity, quality, and use of intellectual-type games for the four-year-old child
(same categories as above for reading material, records)

What is the mother doing to prepare the child for school?
"Are there any particular things you are doing now with (four-year-old child) or that he is doing that you think may help him when he gets to school?"

The mother's response was recorded verbatim, and probes were used, where applicable, to obtain an account of concrete, specific actions the mother was taking to prepare the child for school.

How mother answers child's questions

"What do you do if (four-year-old child) asks you a question that you can't answer?"

(look it up with him; look it up for him; send him to someone else; ask someone else for him; tell him you don't know; answer as best you can; change the subject or ignore him; some combination of the above)

Reading material for adults and for older children: quantity, quality, use

(for each age group, parents and siblings, information was obtained and scored in the categories listed above for reading material for the child.)

Records for adults and for older children: quantity, quality, use

(same categories as above for child)

Intellectual games and hobbies for adults and for older children: quantity, quality, use

(same categories as above for child)

"Do you (mother) generally find things out by reading the newspapers, listening to the radio or TV, or by talking to friends?"

"Some people enjoy reading a magazine or book when they have a few minutes, while others are not too interested in reading. Do you (mother) read any magazines regularly (at least every other issue)?"

If yes, specify which magazines.

"In the last month or so, have you (mother) read anything in books?"

"In magazines?"

"In newspapers?"

"In pamphlets?"

"Other types of reading material?" (specify)

"What kinds of books do you (mother) like best? Do you prefer love stories, biographies, books on how to do things, stories of family life, books of adventure, or something else?"

Mothers' first two choices were recorded

(academic subjects; biography; books on how to do things; stories of love and romance; stories of family life; books of adventure; mystery books; other books: specify)

Utilization of library resources
"Where is your nearest library?"
"Do you have a library card?"
"Do you ever go to the library? How often?"
(once a week; once every two weeks; once a month; once every six months; once a year; less than once a year)
"When you go to the library, about how many books do you usually get for yourself?"
"About how many books do you usually get for the children?"
(when applicable) "Do the older children have library cards?"

For each of a list of holidays, mother was aksed to describe the family's activities and the children's participation in both preparation and celebration.
(Thanksgiving; Christmas; New Year's; Labor Day; birthdays and family anniversaries; Memorial Day; Fourth of July)

Interviewer's description of family interaction

Religious activities

Is the mother a member of the church? Is the father?

Mother's frequency of church attendance
(4 to 7 times a week; 2 or 3 times a week; once a week; at least once a month; less than once a month; never)

Father's frequency of church attendance
(same categories as above for mother)

Does the four-year-old child attend daily Bible school in the summer?

Does he attend Sunday school?

Does he participate in any other church activities for children?
(if yes, specify)

Mother's activities

The actual name of each organization the mother belongs to and the activities or purpose of the group were recorded. The groups were assigned to the following categories:
(church-related; political; school-related; self-education; community-oriented; patriotic or military; social)
Her involvement in each group was rated as
(very active--holds or has held office, acts on committees, attends regularly, is very interested; active--attends meetings fairly regularly, sometimes helps prepare, is interested; member--intermittent attendance, does not help prepare, retains slight interest in group; non-member--does not belong but sometimes attends meetings or retains some interest; or no involvement in this type of group)

Father's activities

Same as above for mother; mother was asked to indicate the extent of father's participation in the different types of groups, and to list each group to which he belonged and its purpose.

Extent and type of adult socializing

"When you (parents) get together with your friends, where do you usually go?"
(ballet, theater, opera, or concerts; clubs and lodges; nightclubs and restaurants; parties; sporting events; movies; coffee houses; bars or taverns; one of our homes; other places specified by mother)

"How often do you (mother) visit (pass the time of day) with, or stop and talk with the people who live within a few blocks of you?"
(several times a day; 6 or 7 days a week; 3 to 5 days a week; 1 or 2 days a week; once or twice a month; once in a while; almost never)

"Are these almost all relatives, almost all friends, or both relatives and friends?"

"About how much time would you say you (mother) spend each week visiting people at home or having somebody visit you?"
(more than 20 hours; 15 to 20 hours; 10 to 15 hours; 7 to 10 hours; 5 to 7 hours; 3 to 5 hours; 2 to 3 hours; 1 hour; none)

One non-interview item was used in rating the home resources patterns scales: mother's and child's appearance during their visit to the University for testing, along with notes made by the interviewer about their appearance during the home visit--neatness and cleanliness, appropriateness of dress to the occasion and the weather, and consistency of physical appearance.

Construction of the Scales

Within each of the nine groupings of sources of information about different resource-pattern areas, four ratings were combined to yield a range of five scores. Availability and utilization of resources were each rated for quantity and quality in terms of orientation toward educability. Simple plus (+) and minus (-) ratings were used in the initial steps. (See chart on page 237)

Scoring the Interview Data

Twelve cases were rated at a time, three from each of the four social status levels represented in the sample; social class was masked for each case. All cases in a set of twelve were rated together on each scale; that is, all were rated on Scale I, then all on Scale II, etc. Reliability coefficients of .70 to .90 were obtained for a group of cases coded by three raters. Similar size coefficients were obtained for intra-rater reliability.

Scale Construction

Availability		Utilization		Summary	Numerical
Quantity	Quality	Quantity	Quality	Symbol	Rating
+	+	+	+	+ +	5
-	+				
or		+	+	+	4
+	-				
+	+	-	-	+ -	
	or			or	3
-	-	+	+	- +	
		-	+		
-	-	or		-	2
		+	-		
-	-	-	-	- -	1

The Home Resources Patterns and Scales

Scale I. Physical Space Pattern

Description

Physical space refers to the arrangement of activity areas and equipment inside the home, and how they are used and maintained. The basic issue evaluated by this scale is: is space ample, uncrowded, and well-maintained, or is it limited and poorly-maintained? Sources of information include the interviewer's description of the home, rooms to people ratio, indoor play area, sleeping arrangements for the child, household appliances, and furnishings; number and use as well as description of these resources are indicators of the space pattern. Availability of resources refers to the extent to which the over-all physical space is ample and uncrowded. Utilization of resources included presence or privacy and variety, and the degree to which space and equipment are well-maintained.

Ratings

5= High. Very ample, uncrowded, well-maintained spaces and equipment

4= Fairly unrestricted and well-maintained space and equipment

3= Fairly unrestricted but somewhat poorly kept space and equipment; or somewhat restricted but well maintained

2= Somewhat limited space and equipment, somewhat poorly kept

1= Low. Extremely limited space and equipment, disordered and poorly-maintained

Sample Ratings

High (4 or 5). The child sleeps alone in his own room and has a large, clean play area. There is considerable variety of operating equipment in the home (more than a dozen different appliances), and the furnishings are in excellent condition. The home has eight rooms for four people.

Medium (3). The child sleeps in a bedroom with an opposite-sexed sibling. He has a large play area in fair condition in his bedroom. The home has seven different appliances and a telephone. The furnishings are in fair condition and are adequate for the space. There are five rooms for six people.

Low (1 or 2). The child sleeps in a bed with four other siblings of the same sex. His indoor play area is inadequate and in poor condition. There are four operating appliances in the home, not including a telephone. Flies buzz around open garbage bins in the home. There are three rooms for four people.

Scale II: Physical Movement Pattern

Description

This pattern refers to the child's physical movements out into the neighborhood and surrounding community. The basic issue is: is his movement unrestricted, varied, and safe? Resources include: the outdoor play area, outdoor mobile and stationary toys and equipment, independent play opportunities, neighborhood surroundings, outdoor activity on a typical day, and time spent indoors watching television. Availability refers to both amount and variety of resources present which encourage active mobility. Utilization of resources includes not only the extent to which the child is involved in activities outside the home, but also how safe his movements appear to be. The over-all rating tends to be influenced by the child's use of television, which might inhibit out-of-doors activity.

Ratings

5= High. Highly unrestricted and safe spaces, and varied movement

4= Generally unrestricted and safe spaces, and fairly active movement with a fair amount of variety

3= Somewhat restricted space, safety, or cleanliness, but fairly active movement

2= Rather haphazard, unsafe, and unsupervised activity, regardless of whether space is restricted

1= Low. Highly restricted and unsafe space, and child not very active

Sample Ratings

High (4 or 5). The child has the use of a large private yard that is clean, safe, and protected for playing. He has both mobile and stationary outdoor toys and makes much use of them. His mother allows him to play with children on the block, and in a typical day he goes out to play with them in the yard, and also over to his grandmother's house to visit. There are some restriction placed on his television viewing. His home is in a well-kept residential neighborhood.

Medium (3). The child has a large private yard in only fair condition. Although he has no mobile toys, he has stationary outdoor equipment which he uses frequently. His mother allows him to play on the porch or in the yard only with siblings or children she knows. His mother says he watches 22 television programs always or often, amounting to four or five hours of television viewing each day. On a typical day he goes out twice and spends the rest of his time watching television.

Low (1 or 2). The only outdoor play areas for the child are either the sidewalk in front of the building where he lives, or a dirty, unsafe vacant lot. The neighborhood is characterized by dilapidated buildings, unkept yards, and litter. The child has a tricycle which he uses often. His mother allows him to play either with siblings or with neighbor children. In a typical day, he watches television on four occasions and twice goes outside with his mother.

Scale III: Physical Appearance and Care Pattern

Description

This pattern is composed of routine caretaking behavior. The basic issue involves mother's and child's appearance as well as provision for routine meals and physical care for the child. Resources include: the child's clothing, his and his mother's appearance in the home and at the testing sessions, and home routines related to meals, naps, and bedtime in a typical day. Availability of resources refers to variety as well as presence or absence, and to the child's participation in routines. Also important to the rating is the pattern consistency: if the child's clothing and appearance are adequante, are mother's also?

Ratings

5=	High.	Very good appearance and routine care
4=		Fairly good appearance and routine care
3=		Fairly good, but somewhat inconsistent appearance and care
2=		Fairly poor appearance and care
1=	Low.	Very poor and neglected appearance and care

Sample Ratings

High (4 or 5). The child's clothing is excellent and his mother is neatly dressed. In a typical day, the child has regular meals with nutritional variety, a snack at mid-morning, and a nap in the afternoon. After his bath, he goes to bed about 8:00 pm.

Medium (3) The child's clothing is adequate. At the testing session he is neat, but his mother is poorly dressed. In a typical day, mother lets him stay up late to watch television; he is likely to fall asleep in a chair. Sometimes he naps. Mother will clean him before he eats, and he has a morning bath.

Low (1 or 2). The child's clothing is inadequate in both quantity and condition, but both he and his mother were neat at the testing session. During a typical day, he has a light breakfast and whatever he can find for lunch. He goes to bed at 11:45 pm.

Scale IV: Play Pattern

Description

This pattern includes the amount, variety, and use of toys and toy substitutes, and opportunities for the child to play with a variety of other children. Adult participation in his play, and any conflict between time for television and time for play, are also taken into account. The basic issue is: is there variety, activity, and stimulation in the child's everyday play? Play resources include: outdoor stationary equipment, sand box, pool, or doll house; and indoor construction toys, role-playing toys, school-oriented toys, and expressive toys.

Ratings

5= High.	Very active play pattern with great variety and stimulation
4=	Fairly active play with good variety and stimulation
3=	Some activity in play and some variety and stimulation
2=	Some activity but poor variety and little stimulation
1= Low.	Resources for play are almost entirely lacking

Sample Ratings

High (4 or 5). The child has some toys in all categories except for the school-oriented. He uses all his toys regularly, but most often the indoor types. He enjoys housekeeping play, and mother substitutes mixing batter and "cooking" on the stove for toys; he wants to help mother all day. In a typical day he watches television for an hour with mother, plays with his sister, other children, or with his father. Mother encourages him to play with others.

Medium (3) The child uses role-playing toys extremely often, a tricycle regularly, and other toys sometimes. Dolls are the child's favorite toy. Mother does not offer any toy substitutes. In a typical day, the child watches television about three hours and plays outside with doll and buggy and inside with a friend and play-dishes.

Low (1 or 2). The child has no toys of his own, but enjoys playing with a sibling's doll when allowed to. In a typical day he watches television for six hours or more and after dinner goes outside to play with siblings.

Scale V: Task and Work Pattern

Description

Task refers to the child's self-help in dressing, washing, toilet, etc. Work refers to his efforts to become part of the home routines. The basic issue is: does the home task/work atmosphere provide for active involvement of the child with encouragement and instructions from parents? Resources include: self-reliance measures, work routines, instruction and encouragement from family members. Utilization of resources is indicated by evidence of the child's participation and by the mother's response to hypothetical situations in which the child attempts to master certain skills: sweeping, feeding himself, and helping mother shop.

Ratings

5= High.	High involvement in task and work; high encouragement and tolerance of accidents; use of child's attempts as learning situations
4=	Fairly high involvement in tasks, with encouragement; some tolerance, but not so much explanation and instruction
3=	Moderate involvement; sometimes tolerance, sometimes punitiveness towards accidents
2=	Some participation in tasks but with demanding, punitive orientation
1= Low.	Low involvement; punitive orientation and no encouragement

Sample Ratings

High (4 or 5). Mother encourages self-reliance in the child, and he is able to dress himself, use the toilet, wash his hands, get a drink of water or a snack, and perform small household tasks. He tries to "help" mother clean, and goes to get things for her. In mastery situations, if he spilled soup while eating, mother would clean him and encourage him to do better; at the supermarket, she would have him stay by the side of the cart and show him things on the shelves he can get for her; if he broke something valuable while trying to sweep, she would tell him he is not ready for sweeping around things like that and would let him sweep where such things are out of the way.

Medium (3). Mother allows but doesn't particularly encourage the child in small self-help tasks, but he can do most of them and tries to clean dishes and do little chores, such as sweeping or mopping, before he goes out to play. In mastery situations, mother says she would spank him when he has an accident such as breaking or spilling something, and she would make him stay out of the way at market.

Low (1 or 2). The child cannot dress himself or wash his hands, and mother discourages him from attempting small household chores. In mastery situations, soup spilling would call for cleaning up and showing him the way it should be done so it wouldn't happen again; at the supermarket, she would not let him fool around with things that don't belong to him, and she would make him stay out of the way; if he didn't obey, he would be spanked. Breaking something while trying to sweep was amusing to mother: she wouldn't get mad, but he would have to wait until he was older to try again.

Scale VI: Direct Learning Pattern

Description

This pattern reflects the specifically school-oriented nature of the resources available for use by the four-year-old. It pertains solely to the child, in contrast to Scale VII, which involves other family members. The basic issue is: does the home provide a variety of stimulating school-oriented toys, books, records, and games for the child; how mother answers his questions and prepares him for school. Utilization of resources is reflected in adult participation in such activities, whether the child is read to regularly, and what mother says she would do if he had accidents while attempting to master school-related resources such as paints.

Ratings

5= High. Great variety, stimulation, and extensive teaching and learning opportunities for the child

4= Some variety, stimulation, and fairly extensive opportunities for teaching and learning

3= Some variety, and some teaching and learning

2= Few opportunities for teaching and learning

1= Low. Extremely limited and negative environment for teaching and learning

Sample Ratings

High (4 or 5). Mother admits she doesn't know answers to the child's questions, but she tries to find out by looking them up. To get him ready for school, she will take him for a visit and to meet the teacher; she is also teaching him to read and write. If the child had an accident when painting, mother would tolerate it but says it wouldn't be too bad because he paints in the kitchen or basement anyway. If he took apart a clock, she would first tell him not to do it and then get it fixed: if it happened a second time, he would have to face the consequences. The child has both school-oriented and expressive toys which he uses only sometimes; some others which he has asked for, mother says she will get for him. Mother reads to the child more than once a week, and the child has a rich quantity of excellent reading material which he often uses by himself. He has and uses good quantities of children's records and games of good quality.

Medium (3). The child has a few books of good quality which he uses often, and his mother joins him at times. He often uses the few games he has, and the good quantity of school and expressive toys. Mother reads to him more than once a week. To answer his questions, she says she has a book to tell how to explain. For school, she is teaching him the ABC's and names of things. If he spilled paint while making a picture, mother would talk to him to get him to be more careful, and she wouldn't let him paint in the living room. She would whip him if he took a clock apart.

Low (1 or 2). There is a minimal quantity of reading material, records, and games for the child; they are of poor quality, and he never uses them. No one ever reads to him. He does have a good number of school and expressive toys, and he uses his coloring set extremely often. Mother says she tries to look up answers to his questions somehow. Spills while painting would be tolerated, but mother thinks he should be more careful.

Scale VII: Indirect Learning Pattern

Description

This pattern refers to the quantity, quality, and utilization of learning resources by family members other than the four-year-old. The basic issue is: is the family's learning environment rich or limited? This pattern is assumed to have an indirect effect upon the young child's supply of experience and information. Resources include: reading materials, records, hobbies, and games for adults and older children, magazines, books, and pamphlets read regularly by mother; mother's sources of information; use of library and educational television; and experiences of educational value which might occur during a typical day.

Ratings

5= High. Very rich environment; high utilization of extensive and stimulating opportunities for direct learning.

4= Fairly extensive and stimulating opportunities and use

3= Moderate variety of opportunities for learning: not a great quantity of learning resources, or resources are not often used; environmental inconsistency

2= Some opportunities for learning, but little variety or stimulation; inconsistent and low

1= Low. Extremely limited and negative environment for learning: consistently low

Sample Ratings

High (4 or 5). Mother's sources of information include the radio and two newspapers. She regularly reads two magazines, and in the last month she has read both books and pamphlets. She has a library card and goes to the library about once a month. She watches educational television, and also is currently doing graduate work. The home has a good quantity of adult reading material and records of very good quality which are used often, and a rich quantity of very good reading material for the older children, who use them extremely often.

Medium (3). Mother uses newspapers to obtain information, and regularly reads magazines. She knows where the library is located, but doesn't use it; however, the older children have cards. Mother watches educational television. In the home, adult reading material, records, and hobbies or games are all very few in quantity, poor in quality, and seldom used. The same resources for the older children, although poor in quality, are adequate in quantity and regularly used.

Low (1 or 2). Mother occasionally reads a newspaper or watches television as information sources. She hasn't read any books, magazines, or pamphlets in the last month, and reads no magazines regularly. She prefers reading love stories. She isn't sure where the library is, doesn't have a card, and says she goes there less than once a year. She does watch a religious program on educational television. For both adults and older children, reading material, records, and games are virtually nonexistent; the few they have are of poor quality and never used.

Scale VIII: Direct Social Contacts Pattern

Description

This pattern refers specifically to the child's social contacts with his mother, other family members, and others outside the home. The basic issue is: does the child have extensive, varied, and positive contacts with others? Resources include the daily interaction he has with his mother in other than caretaking tasks; provision for spending time with his father; involvement in family meals and celebrations and in church activities; and the extent of his play with other children. Utilization includes some consideration of the quality of all his social contacts, and the over-all quality of family interaction.

Ratings

5= High.	Quantity and quality of contacts and interactions are highly extensive, varied, and positive
4=	Quantity and quality of contacts are fairly extensive, varied, and positive
3=	Quantity and quality of contacts are uneven but rather extensive
2=	Quantity and quality of contacts are uneven and fairly limited
1= Low.	Quantity and quality of contacts are extremely limited

Sample Ratings

High (4 or 5). The child participates in some eight different holidays and celebrations with mother's and father's extended families.

As the minister's godson, he sits with him at the altar during church services. In a typical day, his father spends some time with him and takes him to places such as the police station. The child sings, plays, and reads with mother; and he plays often with siblings and neighbors. The family appears to be close-knit and to enjoy each other.

Medium (3). The child participates in four family gatherings on holidays and anniversaries. All celebrations are spent at grandmother's. The child doesn't participate in any church activities, and his play is restricted to siblings only. In a typical day, he watches television with siblings, mother, and her friends; plays with siblings; and then eats with mother and siblings. The parents have been separated many times, but father visits frequently and they all do things together as a family.

Low (1 or 2). This family holds no holiday or anniversary celebrations together. The parents prefer to go drinking with friends, excluding the children from the celebration. The child is seldom involved in church activities, but he is allowed to play with any children on the block, as well as with siblings and neighbors. In a typical day, he helps mother clean up, his grandmother takes care of the children, and the child does not eat dinner with his parents. He gets along well with his family but fights about possessions.

Scale IX: Indirect Social Contacts Pattern

Description

This pattern refers to contacts between the family and others; the child's contacts, considered in Scale VIII, are excluded. The basic issue is: are social contacts and the interaction of the family with others extensive, active, and varied? Such contacts are regarded as resources which, by providing rich experience for family members, may indirectly enrich the child's social experience. Special emphasis is placed on availability and utilization of "quality" contacts, those which provide information on education, or which demand responsible involvement. For example, going to the museum or ballet is more highly rated than mere membership in organizations. Similarly, a balance of contacts between relatives and friends or community groups is important to the rating. Resources thus include primary contacts outside the home, although persons or interests brought into the family interaction from outside contacts are also examined: parents' activities, involvement in organizations and in church, where they go with friends, and the amount of weekly visiting.

Ratings

5= High. Many contacts with rich variety

4= Many contacts with not so rich and stimulating variety; or rich and stimulating variety but only a fair number of contacts

3= Fair number and variety of contacts

2= Some social involvement and activity, with either little variety or poor quality

1= Low. Extremely limited involvement and variety

Sample Ratings

High (4 or 5). Mother and father are each very active in a single organization: the mother in a YWCA homemaker's club, the father in a union organization. Both are church members, mother going once a week and father once a month or less. They like to go bowling with friends. Mother visits about 15 to 20 hours each week; on a typical day, she goes to tea with a neighbor, goes for a walk, to the park, and to a museum. She also attends school.

Medium (3). Father belongs to one organization and mother sometimes attends meetings of another, of which she is not a member. Father never participates in church activities, but he maintains his membership. His wife attends church once a month. They like to get together with friends at home to play cards, or go to the movies or ball games. Sometimes they go to a museum or the zoo. Mother passes the time of day almost every day with friends and visits about 3 to 5 hours each week. In a typical day, father goes to the store and one of the children attends kindergarten. Family interaction appears to be good.

Low (1 or 2). Neither parent participates in any organized activity, and only the mother is a church member, going to services less than once a month. The parents prefer to get together with friends at home. Mother passes the time of day a few times a week with friends, and she visits only 2 or 3 hours each week.

Home Resources Factor Score

Scores for all families in the Cognitive Environment Study sample, on each of the nine Home Resources Patterns scales, were subjected to a principal component factor analysis. Each of the nine scales loaded very highly on the first of nine unrotated factors:

Scale	Loading on First Unrotated Factor
Physical Space	.774
Physical Movement	.675
Physical Appearance and Care	.788
Play	.775
Task and Work	.558
Direct Learning	.821
Indirect Learning	.784
Direct Social Contacts	.691
Indirect Social Contacts	.766

Factor scores were obtained for each case on this first factor. This general score, which takes into account availability of resources but is seen more importantly as an indicator of utilization of resources, was used as the basic home resources measure in most of the analyses of data from the project.

APPENDIX C

PLUTCHIK EXPLORATORY-INTEREST QUESTIONNAIRE

The Plutchik Exploratory-Interest Questionnaire (E-I) is an experimental instrument developed by Robert Plutchik (Department of Psychology, Hofstra University, Hempstead, New York) to measure curiosity motivation. It consists of a series of 58 items involving activities defined as exploratory or non-exploratory in nature. The E-I was administered to mothers during a testing session at the University. The tester read each of the 58 items to the respondent and asked her to indicate whether this was an activity she liked or disliked.

The 58 items, in order of administration, were:

1. meeting new people
2. seeing sporting events
3. reading about distant lands
4. socializing
5. rummaging through scrap piles
6. writing letters
7. experimenting with equipment
8. listening to stories
9. handling strange objects
10. going to parties
11. hearing lectures
12. talking with children
13. reading surveys (give example)
14. shopping for clothes
15. discussing philosophy (give example)
16. athletics
17. visiting new places
18. telling stories
19. watching animals
20. playing games
21. going on hikes
22. talking on the telephone
23. looking through books
24. telling jokes
25. exchanging ideas
26. designing things
27. dissecting animals (give example)
28. taking pictures
29. reading non-fiction
30. doing puzzles
31. exploring new places
32. listening to music
33. smelling things
34. fixing things
35. questioning people about their ideas
36. gossiping
37. solving problems
38. discussing politics
39. reading scientific articles
40. reading current novels
41. tasting new foods
42. writing your experiences
43. examining things
44. reading poetry
45. analyzing problems
46. watching people in groups
47. touching sculpture pieces
48. intellectual arguments
49. discovering secret places
50. writing poetry
51. having new experiences
52. eavesdropping
53. studying history
54. collecting things
55. travelling
56. reading mysteries
57. asking people about their experiences
58. learning languages

Each odd-numbered item in the E-I is an "exploratory" item. Each respondent received two scores: the total number of activities she said she liked to do (possible total 58), and the total number of exploratory (odd-numbered) items she said she liked (possible total 29).

APPENDIX D

PROCEDURES FOR ADMINISTERING AND SCORING THE "FIRST DAY" QUESTION

Administration

During the home interview, mothers were asked the "First Day" question:

> LET'S IMAGINE THAT _____ IS OLD ENOUGH TO GO TO THE PUBLIC SCHOOL FOR THE FIRST TIME. HOW DO YOU THINK YOU WOULD PREPARE HIM/HER? WHAT WOULD YOU DO OR TELL HIM/HER?

Neutral probes were used: the interviewer was asked to "Probe without giving suggestions, as far as possible (e.g., 'Anything else?' or 'Tell me more.') If it doesn't come out spontaneously, be sure to ask: 'What will you tell him/her about that first day at school?'" Mothers' responses were tape-recorded and typed transcripts or protocols were later prepared for scoring purposes.

Scoring

The focus in scoring the mothers' responses is on the transmission of information from mother to child. The responses cannot be taken as predictions of what any mother will actually say to her child as that first day nears, but the open-ended question is used here as a projective technique to assess the subject's estimation of the relevant areas of the school situation (content analysis). In addition, the measure provides a sample of the subject's language style and method of communication which is suitable for comparison to other more direct measures (method of communication). In scoring the responses, both content and method of communication are taken into account.

Unit of Scoring

The informalities of the spoken language and the punctuation introduced by those transcribing the tapes of the mothers' interviews create many difficulties in defining a meaningful unit for scoring. Most commonly, there appear written sentences which are composed of many completed thoughts, or many "thought-sentences." That is, conjunctions and punctuation marks which connect (such as , ; --, etc.) create a smooth-reading flow which for scoring purposes must be broken down into message units. A completed thought is composed of essentially the subject-and-predicate pair. If a dependent clause is used with relation to an independent clause, both clauses constitute a simple unit. Exception is made in one case: where a subordinate conjunction (e.g., "because") introduces a new complete thought, the following phrase is coded as though it were independent of the unit(s). Subjects and objects are often assumed by the mother, as for example when she says "to mind" and obviously means, "I would tell him to mind." Such a phrase usually constitutes a meaningful unit

In order to assess proportionate use of each type of response within a single protocol, as well as to compare subjects for simple presence or absence of differential attention to any given category of response, it is important that every grammatically meaningful unit is counted. Although many such units do not answer the question and are not meaningful in terms of the scoring categories being used, these units are tallied: the "Irrelevant" category provides for their scoring.

Excluded units are those which are not a response to the question but are a part of the subject's conversation with the interviewer or with others, or are a part of the behavior of the subject as she "settles in" in preparation for her response: "Ummm, when do I begin?", "Is it on?" (referring to the mike), or "Shut up, Joey" (aside to a child). A concluding "That's all" or "I can't think of anything else," is not scored. And responses to a biased probe question by the interviewer (for example, "What would you tell him about the teacher?" or "Would you tell him to . . .?") are not scored.

The unit of scoring, then, is a completed thought, although it may not necessarily be a sentence. Verbatim or essential repetition of a completed thought will be counted for as many units as the subject uses to express herself. All elaborations of and additions to a completed thought are similarly tallied, so long as each addition or elaboration is itself a completed thought.

A tally of the total number of units is made before any attempt at categorizing and scoring. This tally is made in grammatical terms as described above. Although the scorer cannot avoid being aware of the content of the protocol and of each unit as it is so tallied, every attempt is made to ignore the meaning of the message and to concentrate on the subject-and-predicate structure until after the tally is completed and actual scoring begins. Similarly, each unit is coded by content without reference to the content of other units, except as specified below.

Categories for Coding of Content

Obedience

When the mother depicts school as a situation to which her child will have to conform by obeying the teacher, by acting in a socially acceptable manner with peers, or by following some impersonal set of institutional rules, her comments on the child's behavioral conformity are coded in the following content areas:

Teacher. The teacher's role in the classroom is one of authority. She is in charge, and the child must be prepared to obey her. The person-to-person relationship of teacher and child distinguishes this category from the others (e.g., categories relating to the issue of obedience, particularly that of classroom conformity).

Classroom. The child's behavior as a member of a group, his class, should be one of conformity to rules which may be implicit or explicit. He is expected to deport himself in a manner which will allow the smooth running of the classroom as a learning environment. The conformity expected and demanded in the classroom does not refer merely to the behavior occurring within the four walls of the room, but to the behavior required of a child in a group which is concerned with some learning experience provided by the school and the teacher. Thus the conforming behavior in the classroom specified by the mother may relate to the social-peer structure rather than to the learning experience. The fact that classroom conformity is of a more restrictive nature than social-peer conformity may help clarify this distinction.

Social and peer. The child is constantly confronted with people, mostly other children, both within the confines of the classroom and in the larger world of the school and neighborhood; he must learn to interact in a socially acceptable manner. Some aspects of this conformity may be made explicit by the mother or the teacher; others are open to be determined by other children within the context of a specific situation such as a game.

Institutions. There are a number of rules and standards to which a child must conform in order to function as one element of the larger complex, the school. These include practicing safety and health rules, respecting his own and others' possessions, and following practices of personal care which indicate his readiness to partake of a formal educational experience. Thus he must keep his hands clean, get to and from school safely, protect his belongings, and avoid any number of physical hazards in and around the classroom and school

Achievement

Mothers' responses in this category depict school as an opportunity for the child to attain increasing levels of achievement in preparation for his future The school provides the child with a formal introduction to skills and concepts which are important to his future, and the mother is concerned with his endeavors to master them.

Affective Elements

Here school may be considered as a novel situation to which the mother wants to introduce her child. While he may have had nursery school experience or may have older siblings from whom he has heard about school, actually going into that new building full of strangers will naturally have an impact. A mother may anticipate this fact, and she may focus her attention in differing amounts on either of two aspects of the situation. Responses in this category include mother's apparent awareness of negative and positive elements, as well as explicit statements of what she will do or say to the child.

Negative elements. School is a strange place; a young child may be afraid of its strangeness or of being left alone, without mother.

Positive elements. School is an exciting adventure, an experience to which a child naturally looks forward. He will meet other boys and girls his own age with whom he can play; there will be a new adult who will help him learn many new skills; he is a "big boy" and is old enough to be allowed the privilege of entering this new adventure. His mother and/or members of the family are eager to help him and to pay attention to him at this crucial time; they may accompany him to or from school or, in advance, take him there for a visit or play school at home and discuss with him the things he will do there.

Preparation, Vague, Irrelevant

Responses to an open-ended question may constitute something less than a clear and organized answer to the question. A response may not be explicit enough to be clearly assigned to one of the scoring categories. Misinterpretation of the "first day" question may lead to an enumeration of things the mother has attempted to teach the child rather than, as the question asks, what she will tell him about that first day; unlike those behaviors of the mother which can be scored as "support," such attempts to prepare the child are concerned with isolated and specific tasks or ideas. Both of these types of response, the vague and the attempts at preparation, are important even thought they may fail to characterize the mother's ideas about school or her method of communicating those ideas.

Finally, those responses which are not relevant to the question must be dealt with. These occur when the mother has misunderstood the question or when she follows a train of ideas leading away from the issue of school, most often toward comments on the child or on the amount of thought she has given to the question.

Categories for Coding Method of Communication

The content categories of obedience and achievement are also analyzed in terms of the mother's method of communicating this information to her child. Two modes of communication are considered--imperative (M), and instructive (N).

Imperative Communication

Content is conveyed to the child in terms of an unqualified command: the child must or must not do this, period. This command may be given without naming a source of authority, although this may be implied. Specific commands such as "Sit down," "Don't holler," are included here. Or a source of authority may be named in giving the command; this authority may be a person such as the teacher, a group such as the other children, or an institution such as the school or "they" (e.g., "Mind the teacher;" "Do what they say"). The relationship between the child and the authority is, however, not explicit.

Instructive Communication

As opposed to the imperative response, which includes only unqualified commands with no explicit reference to an authority or provision of a rationale, instructive responses provide some rationale for the behavior expected of the child, and thus allow--at least theoretically--some choice, some discretion on his part.

The rationale which is provided by instructive communication may be one of three types: a reference to the power structure of the situation, a reference to broad social norms and expectations, or an attempt to individualize and personalize the situation. The code for instructive responses includes Ns (power), Nn (norms), and Np (person).

Instructive-power (Ns) implies a hierarchical relationship between the child and some named authority; physical consequences of deviancy may be mentioned or implied. The child must obey those "over him."

Instructive-norms (Nn) refers to a less explicit source of authority, namely society at large; there may be reference to status characteristics of the child (e.g., age, sex) and/or of others, but more often the reference is vague. In contrast to the hierarchical relationships implied or stated in instructive-power, the emphasis here is on laterality or relationships, on role-definition as the rationale. The child is expected to behave in a certain way because he is a child; he interacts with the role of teacher, rather than with the teacher as a powerful being or as a personality.

Instructive-person (Np) refers to personalization of the situation, taking into account unique characteristics of the child, of another, or of the situation. Given this particular context the child is expected to act in this way, because he is this particular child.

The rationale which accompanies the command, the "why" which justifies the demand for certain necessary behaviors or attitudes, may not itself be a command. The rationale which defines the Teacher-instructive response as contrasted with the Teacher-imperative (e.g., "Teacher is at school like mother is at home") is often scored as a "Support" response. This general rule applies to all categories.

Obedience--Scoring Categories and Criteria for Scoring

Teacher-imperative (TM) is a command to behave in a certain manner with reference to the teacher as the object of that behavior or as the authority for that behavior. The command may involve a specific behavior or a general attitude toward the teacher as authority; in either way, it is absolute.

Teacher-instructive (TNs, TNn, TNp) refers to a command to behave in a certain manner with reference to the teacher as the object of that behavior or as the source of authority for that behavior, accompanied by a rationale which characterizes the teacher as a source of sanctions for that behavior. The command may involve a specific behavior or a general orientation or attitude toward the teacher as an authority and source of sanctions.

Classroom-imperative (CM) refers to a command to behave in a certain manner with reference to the child's place in the physical and social organization of the classroom. The command may involve a specific behavior or a general standard to which the child must conform in order to allow the classroom and the class to function smoothly as a learning situation; in either event, it is absolute.

Classroom-instructive (CNs, CNn, CNp) refers to a command to behave in a certain manner with reference to the child's place in the classroom, accompanied by a rationale which suggests or states a reason and/or sanctions for that behavior. The command may involve a specific behavior or a general attitude toward a standard of behavior which is accompanied by sanctions.

Social and Peers-imperative (SM) refers to a command to behave in a certain manner with reference to the social situation and with particular reference to the other children. The command may involve a specific behavior or a general standard. A source of authority may or may not be involved. The command is an absolute.

Social and Peers-instructive (SNs, SNn, SNp) refers to a command to behave in a certain manner with reference to the social situation, accompanied by a rationale which suggests or states a reason and/or sanctions for that behavior. The command may involve a specific behavior or a general attitude toward the reasons and sanctions for behaving in a socially acceptable manner.

Institutions-imperative (IM) refers to a command to conform to a set of rules and standards established by cultural or institutional authority which ensure that the child will fit smoothly into the total institutional complex of the school. Common items of concern are safety and health rules, respect for his own and others' possessions, and a general readiness to accept the dictates of an institutional authority. The command is absolute.

Institutions-instructive (INs, INn, INp) refers to a command to conform to a set of rules and standards established by a cultural or institutional authority, accompanied by a rationale or explanation of the necessity of such authority.

Obedience-vague (OV) refers to a simple "be good" or "act nice" or to a reference to "how to behave" not elaborated. The response is concerned with obedience and compliance but has no referent or is not distinguishable on the Imperative-Instructive dimension.

Achievement--Scoring Categories and Criteria for Scoring

Achievement-imperative (AM) refers to a command to work at mastering the skills and concepts of an academic nature which the school presents as tasks. The command is absolute.

Achievement-instructive (ANs, ANn, ANp) refers to a command to work at mastering academic skills and concepts, accompanied by a rationale which states the importance of such mastery to either the current or the future worth of the child, or a rationale which states that the mastery of academic tasks is an (or the) important reason for being in school.

Sum Imperative, Instructive, Status- and Person-orientation

Responses in the five categories, Teacher, Classroom, Social and Peers, Institution, and Achievement, were each coded for presence or absence of a rationale, i.e., for Imperative or Instructive methods of communication. Summary scores for use of each method were later computed for each respondent; additional scores for status- and person-orientation were computed for comparability of this measure with the Mastery and the School-Peer Situations measures.

Sum of Imperatives was obtained by adding, for each subject, the number of units in each of the five categories which were not accompanied by rationales.

(Sum Imperative = TM + CM + SM + IM + AM + OV)

Sum of Instructives was similarly obtained by adding the number of units in each of the five categories which were accompanied by a rationale, regardless of whether it was an appeal to power, norms, or personal considerations.

(Sum Instructive = TNs + TNn + TNp + CNs + CNn + CNp + SNs + SNn + SNp + INs + INn + INp + ANs + ANn + ANp)

Status-orientation scores were obtained by summing Imperative, Instructive-power, and Instructive-norms responses in each of the five Obedience and Achievement categories. That is, the Status-orientation score refers to all responses in these five categories except those accompanied by person-oriented appeal.

Person-orientation scores were obtained by summing Instructive-person responses across the five categories of Obedience and Achievement.

(Person-orientation = TNp + CNp + SNp + INp + ANp)

(Status-orientation = Sum Imperative + Sum Instructive - Person-orientation)

Affective Elements--Scoring Categories and Criteria

Negative (S-). Mother is aware of the strangeness of this new experience, and/or the possible or probable fear with which her child will approach it. She may warn the child of the presence of these negative elements, and she may indicate that she expects him not to be afraid.

Negative with Support (S∓). Mother is aware of the presence of negative elements, but she also is aware of or will provide for positive aspects in the new experience. Any combination, then, of awareness of negative elements and awareness of or provision for positive elements, constitutes "∓" support.

Positive (S+). Mother does not mention the negative elements, fear and strangeness. She indicates awareness of or provision for only positive elements.

Vague, Preparation, Irrelevant--
Scoring Categories and Criteria

Vague (V) refers to a response which is related to the school and the child but which is not clear or not explicit enough to be scored in terms of Obedience, Achievement, or Support.

Preparation (P) is coded for a response referring to an experience which the child has had, is now having, or will have, which the mother believes prepares him for school but not clearly referring to the areas of Obedience, Achievement, or Support. The relevance of such experience may be actual or assumed; this differentiation is a matter of the clarity or explicitness of the response. A vague reference to such experience should be scored as Vague. A response which refers explicitly to an area of behavior for which the child will be or is prepared may be of two types; P_1 and P_2.

P_1 refers to institutional, personal, and social skills, such as attendance at nursery school or experience with older siblings and friends, when the relationship between the experience and the area of behavior for which it prepares the child is explicitly stated.

P_2 refers to academic skills, such as playing school or buying books for the child; again, the relevance of the preparation to the school as an academic institution is explicitly stated.

Description of what the school situation will be like is scored as Preparation (P_1 or P_2) if mother explicitly states the link between the child's knowledge of school and preparation for the first day; as Affective (S+) if stated as something enjoyable or fun; otherwise, neutral description or description referring to Obedience or Achievement areas but not clearly representative of those coding categories, is scored as Vague.

Irrelevant (RL). refers to a response which results from misunderstanding of the question or a response which is tangential to it; a concluding remark, such as "That's all," when not preceded by a probe; a statement about the child, such as "he is looking forward to it;" or a response which does not answer the question and has no relevance to it. Such responses should be followed by repetition of the question or by suitable probing questions.

Summary Scores for Content and Method of Communication

Summary scores were obtained for each respondent for the six content categories of response by summing the number of units within each, ignoring method of communication.

(Sum Obedience = TM + TNs + TNn + TNp + CM + CNs,+ CNn + CNp + SM + SNs + SNn + SNp + IM + INs + INn + INp + OV) + OS + SV

(Sum Achievement = AM + ANs + ANn + ANp)

(Sum Affect = S+ + S- + S∓)

(Sum Preparation = P_1 + P_2) + P_3 + HM

Sum Vague and Sum Irrelevant were, of course, merely the number of units in each of these two categories.

Total Message Units refers to the total number of scored response units in the protocol. This sum score was used to obtain proportion, or percentage, scores for both content and method of communication. Thus for each respondent summary scores were obtained which took into account the total length of her response.

Percentage scores for *content* were obtained by dividing the total number of units in each of the content categories by the total number of message units.

Percentage scores were obtained in similar fashion for *method of communication* by dividing the total number of Imperative, Instructive, Status-orientation, and Person-orientation units by the total message units.

Finally, *number of alternatives* refers to the number of different response categories used by the subject.

Example

A protocol with 10 message units--2 TM, 1 TNn, 2 IM, 2 OV, 1 ANn, 2 V--would have 7 alternatives.

Sum Imperative = 6 % Imperative = 60
Sum Instructive = 2 % Instructive = 20
Sum Status-orientation = 8 % Status-orientation = 80
Sum Obedience = 7 % Obedience = 70
Sum Achievement = 1 % Achievement = 10
Sum Vague = 2 % Vague = 20

All other scores are 0.

APPENDIX E

A MEASURE OF MOTHER'S ATTITUDES TOWARD CHILD'S BEHAVIOR LEADING TO MASTERY

During the home interview, mothers were presented a series of nine hypothetical situations in which the child's behavior in the course of mastering certain skills came into conflict with the environment of persons and objects: he damaged property in the home or belonging to others, made a mess, or disturbed someone. The mother was asked what she would do if her child accidentally created such a conflict situation. The mother's responses were tape-recorded, transcribed, and scored for the type of appeal used to effect a change in the child's behavior, to explain to him why such behavior was undesirable, or to avoid or resolve the conflict.

The three basic types of appeal for which the responses were scored were Status-normative, Personal-subjective, and Cognitive-rational, as defined in Chapter IV.

Mastery Situations

1. WHAT WOULD YOU DO IF _____ WAS JUST LEARNING TO RIDE A TRICYCLE AND ACCIDENTALLY RODE INTO A FLOWER BED AND BROKE DOWN A BEAUTIFUL ROSE BUSH BELONGING TO A NEIGHBOR?
2. WHAT WOULD YOU DO IF _____ WAS TRYING TO PAINT A PICTURE AND ACCIDENTALLY SPLASHED PAINT ALL OVER A NEARBY CHAIR WHICH HAD A CLEAN SLIP COVER ON IT? (or on a new rug you had just gotten for your living room?)
3. WHAT WOULD YOU DO IF _____ WAS OUT WITH YOU SOMEPLACE WHERE THERE WERE VERY FINE BOOKS AND HE/SHE TOOK ONE OF THESE TO LOOK AT WHEN HIS/HER HANDS WERE STICKY, AND GOT SPLOTCHES ALL OVER IT?
4. WHAT WOULD YOU DO IF _____ SPILLED SOUP ALL OVER WHILE ATTEMPTING TO FEED HIM/HERSELF?
5. WHAT WOULD YOU DO IF _____ WAS MOLDING A SAND CASTLE OR SOMETHING AT THE BEACH IN THE SUMMER, AND HE/SHE ACCIDENTALLY GOT SOME SAND IN SOMEONE'S EYE?
6. WHAT WOULD YOU DO IF YOU HAD _____ IN A SUPERMARKET, AND HE/SHE KEPT RUNNING AROUND POINTING OUT THINGS ON THE SHELVES SO THAT YOUR SHOPPING WAS SLOWED UP AND HE/SHE WAS GETTING IN THE WAY OF OTHER SHOPPERS?
7. WHAT WOULD YOU DO IF _____ WAS TRYING TO LEARN TO SWEEP AND ACCIDENTALLY BROKE SOMETHING OF VALUE?
8. WHAT WOULD YOU DO IF _____ WAS LEARNING A SONG AND KEPT SINGING, DISTURBING SOMEONE WHO WAS TRYING TO SLEEP?
9. WHAT WOULD YOU DO IF YOU FOUND _____ TAKING A GOOD CLOCK APART SO THAT HE COULD SEE WHAT MADE IT TICK AND HE/SHE EITHER LOST OR BROKE SOME OF THE PIECES?

APPENDIX F

A MEASURE OF MOTHER'S ROLE IN TEACHER/CHILD AND CHILD/PEER SCHOOL SITUATIONS

During the home interview, mothers were presented a series of eight hypothetical situations which might occur in school, and in which conflict occurred between the child and the teacher, his peers, or the institutional demands of the school. In half of the cases, the child was clearly in the wrong; in the others, he was the innocent victim of another's failure to meet expected standards of behavior. Each mother's responses were tape-recorded, transcribed, and later scored for the type of appeal used in her statement of what she would do if her child created such trouble or was the victim of another's misbehavior. The three basic types of appeal for which the responses were scored were: Status-normative, Personal-subjective, and Cognitive-rational. The general definitions as used for this task and for other measures were given in Chapter IV.

Teacher/Child and Child/Peer School Situations

1. WHEN THE TIME COMES FOR _____ TO GO TO SCHOOL AND HE/SHE IS ACTUALLY IN SCHOOL WHAT DO YOU THINK YOU'D DO IF YOU FOUND THAT _____ TALKED IN CLASS WHEN THE TEACHER HAD TOLD THE CHILDREN TO DO THEIR WORK AND CONSTANTLY DISTURBED THE CLASS BY CUTTING UP OR THROWING PAPER AIRPLANES, ETC.?
2. WHAT WOULD YOU DO IF THE TEACHER SCOLDED _____ IN FRONT OF THE CLASS AND SENT HIM/HER TO THE PRINCIPAL FOR SOMETHING HE/SHE DIDN'T DO?
3. WHAT WOULD YOU DO IF _____ BEAT UP ANOTHER LITTLE BOY/GIRL AT SCHOOL WHEN THE OTHER CHILD HAD DONE NOTHING TO _____?
4. WHAT WOULD YOU DO IF _____ WAS BEAT UP AT SCHOOL BY ANOTHER BOY/GIRL WHEN HE/SHE HAD DONE NOTHING TO THIS OTHER BOY/GIRL TO PROVOKE A FIGHT?
5. WHAT WOULD YOU DO IF _____ WAS NOT DOING HIS/HER WORK IN SCHOOL AND NOT DOING THE HOMEWORK WHICH THE TEACHER ASSIGNED?
6. WHAT WOULD YOU DO IF _____'S TEACHER WOULD NOT EXPLAIN HIS/HER WORK TO HIM/HER AND _____ DIDN'T UNDERSTAND HOW TO DO THE WORK OR EXACTLY WHAT IT WAS THAT THE TEACHER EXPECTED OF HIM/HER?
7. WHAT WOULD YOU DO IF _____ WAS GETTING FAILING GRADES AND NOT LEARNING WHAT THE OTHER CHILDREN WERE LEARNING IN SCHOOL?
8. WHAT WOULD YOU DO IF _____ HAD A TEACHER WHO JUST DIDN'T SEEM TO KNOW HOW TO TEACH CHILDREN ANYTHING, ONE WHO WAS INCOMPETENT AND COULDN'T SEEM TO TEACH _____ OR THE OTHER CHILDREN?

APPENDIX G

ADMINISTERING AND SCORING THE "ETCH-A-SKETCH" TASK

The "Etch-a-Sketch" task was the last of the three mother-child interaction situations to be completed during the subjects' second visit to the university and was the final measure to be administered. It was reserved for the end because it required the mothers to exercise continued tight control over their children for periods as long as one hour, so that in many cases subsequent activities would have been seriously affected by fatigue factors. The task was designed to emphasize the affective and control aspects of mother-child interaction, complementing the cognitive sorting tasks which placed a premium on information transmission.

Materials

This task makes use of the "Etch-a-Sketch," a toy sold commercially by the Ohio Art Company, Bryan, Ohio. Two Etch-a-Sketch toys are required for the task if the subjects' productions are to be traced. Also needed are 5" by 7" pieces of very thin tracing paper (equal to the size of the Etch-a-Sketch screen) and a short (less than 5" long) straight-edge or ruler. With this equipment the subjects' productions may be traced and preserved for later scoring.

The models to be copied were drawn in black ink on white 3¼" by 5" cards. Below each model was written the maximum number of points allowed for a perfect copy of the design, an amount which equaled the number of lines in the design; these were used later when the mothers were asked to predict the number of points they could earn. The designs used in our task are shown at the end of this appendix.

Since only vertical and horizontal lines were used, each succeeding design differs from previous ones only in the length and number of lines and is therefore quantitatively but not qualitatively more difficult. The knobs never had to be used simultaneously or turned in both directions to make a specific line. All that was required to make a perfect line was to begin in the proper direction and to stop when the proper length was reached.

Procedure

The mother was first familiarized with the toy while the child was not present. She was allowed to manipulate it freely and note its possibilities and properties on her own. The tester then asked her to construct a square, which the mother continued doing until she could do it easily without help.

The task proper began later when the child was present. The child was seated to the right of the mother, since he was to use the knob on the right (vertical lines). The tester sat across from the mother. After briefly outlining the task the tester left the table and busied herself elsewhere for three minutes while the subjects practiced. When the tester returned she presented the first model to be copied. The exact instructions were as follows:

> (Have mother make a square on the board before task begins. She should have reached that level of performance before she teaches the child in the interaction situation.)
>
> Interaction (Place board in front of mother and child on the table.)
> THIS IS AN ETCH-A-SKETCH. YOU CAN MAKE DIFFERENT SHAPES BY TURNING THE KNOBS. (Tester makes a square.) IN A FEW MINUTES, I WILL GIVE YOU 5 DRAWINGS TO COPY ON THIS BOARD, WORKING TOGETHER. MRS. _____, YOU ARE TO WORK THE LEFT KNOB, AND _____, YOU WORK THE RIGHT KNOB. (Tester points to the knobs as she talks.) YOU MAY NOT TURN EACH OTHER'S KNOBS, BUT MRS. _____, YOU MAY GIVE ANY DIRECTIONS YOU WANT TO. I'M NOT QUITE READY TO BEGIN, SO YOU HAVE A FEW MINUTES TO PRACTICE USING THE BOARD
>
> (3 minute practice period)
>
> WE'RE ABOUT READY TO BEGIN. (Takes board away. Present first model in front of mother and child.) HERE IS THE FIRST DRAWING I'D LIKE YOU TO COPY. TRY TO MAKE IT THE SAME SIZE, THE SAME SHAPE, EVERYTHING JUST THE SAME. AFTER YOU HAVE FINISHED, I WILL COPY IT ON A SHEET OF PAPER SO LATER I CAN SEE JUST HOW CLOSE IT COMES TO THIS DRAWING.
> IF YOU MAKE IT JUST THE SAME AS THIS DRAWING, YOU GET 4 POINTS. IF IT IS NOT JUST THE SAME, YOU WILL GET FEWER POINTS. HOW MANY POINTS, FROM ZERO TO FOUR, DO YOU THINK YOU AND _____ CAN GET ON THIS FIRST DRAWING, WORKING TOGETHER?
> YOU CAN REPEAT EACH DRAWING AS MANY TIMES AS YOU LIKE. AFTER EACH ATTEMPT, I WILL ASK YOU TO DECIDE WHETHER YOU WANT TO TRY IT AGAIN, OR WHETHER YOU WANT TO GO ON TO THE NEXT DRAWING.
> FROM NOW ON, PLEASE DON'T SHAKE OUT THE BOARD, BECAUSE I MUST COPY EACH DRAWING YOU MAKE.
> I'LL MAKE SURE THE LINE STARTS ABOUT HERE (point) SO YOU WON'T HAVE TO WORRY ABOUT THAT (start line slightly above center of board).
>
> (Leave card with figure on it on table facing mother; do not present fresh board until decision is reached.)
>
> Question: HAVE YOU DECIDED?
> ARE YOU GOING TO TRY IT AGAIN, OR DO YOU WANT TO GO ON TO THE NEXT DRAWING?
>
> (Use above question when necessary; i.e., when mother does not spontaneously give decision.)

The tester traced each production (as precisely as possible) while the subjects began a new attempt, at the same or next design, using the alternate Etch-a-Sketch. Each time a new design was attempted (not a repeat of the design) the tester ascertained a prediction from the mother. The task ended when the last production (last attempt at Figure V) was accepted by the mother.

Scoring the Figures

The Etch-a-Sketch productions are scored by comparing the traced figures to the standard models. Anyone tracing figures must be extremely careful to make sure that the subjects' productions are traced *exactly*. Since points are deducted for "tails" extending from corners and for failure to close the figures, tracers should be familiar with the scoring system so that they do not inadvertantly lower scores by creating "tails" when tracing. The scoring system to be described below appears complicated at first, but in practice it is easily and reliably applied. By superimposing the tracings over $\frac{1}{8}$ inch graph paper, the scorer can make the necessary determinations without requiring a ruler or other measurement devices (see page). The scoring system used is as follows:

Complete Figures

Determine a base line length. The base line length, plus or minus $\frac{1}{16}$", is that length to which most of the lines of the figure correspond. It is the *modal* length. For example, if 8 of the 12 lines on the cross are between 15/16" and 17/16", the base length is one inch--the same as that for the model.

Count correct lines. Correct lines are those which are within $\frac{1}{16}$" of the base length and which have *no tails*.

Adjust for base length. If the base length is the same as that for the model, deduct nothing. Otherwise, deduct 1 point for every $\frac{1}{16}$" that the base length differs from the base length of the model.

Adjust for double tails. Deduct 1 additional point for every line on the figure which has two tails--one at each end.

Example

Figure A (cross)		Figure B (cross)
1"	Base length	17/16"
8	No. Correct Lines (proper length, no tails)	8
0	No. Double Tails	2
-	Adjmt. for Base Length	-1
-	Adjmt. for Double Tails	-2
8	SCORE	8 - 1 - 2 = 5

Incomplete Figures

Occasionally subjects will accept a figure which is not closed (i.e., does not form a geometric ploygon). These figures are scored in exactly the same way as complete figures, except that the scores may not exceed the following maximum values:

Figure	Maximum Score
1	0 + the number of attempts made
2	1 + the number of attempts made
3	2 + the number of attempts made
4	3 + the number of attempts made
5	5 + the number of attempts made

In practice it has been found that incomplete figures usually do not earn scores near the maximum. They are usually so poor that no credit can be given at all. The bonus for effort was used only twice in scoring 60 figures. Its main function is to discriminate a little more finely at the lower end of the distribution.

Special Problems and Conventions

(1) Any figure not attempted at all is automatically scored zero.

(2) If one of the first three figures is so large that the adjustment for base length would produce a zero score, but still the figure is symmetrical and has no tails, credit is given. Score 1 point for the square, 2 for the **L**, and 3 for the **T**. If the figure is asymmetrical or has tails, score zero.

(3) If a figure is essentially complete except for a failure of closure in one spot:

(a) Ignore if the hole is less than $\frac{1}{16}$''.
(b) Deduct 1 point if it is more than $\frac{1}{16}$''.
(c) Deduct for a double tail if a line contains both a hole and a tail.

(4) Occasionally two base lengths can be used for a given figure. Usually they yield the same score. If not, award the higher score of the two.

(5) The **L** and the **T** present special problems because the lines are not of equal lengths. Special scoring models with larger base lengths are provided to facilitate scoring. Often it is necessary to score by subtraction rather than addition, deducting from the maximum score 1 point for each tail and 1 point for each $\frac{1}{16}$'' asymmetry (as when one side of the **T** is longer than the other).

If both methods are used, award the higher score.

(6) Results show that scores tend to be low (averaging 25% of the possible total). Consequently it is recommended that credit be given in borderline situations (as when a line is exactly $\frac{1}{16}$'' too long). Whenever it cannot be unequivocally decided whether or not a line is correct, score it as correct.

Performance Measures

Score

Total scores are obtained by summing the scores from the five designs. The score used is the Best Possible Score obtained by summing the scores from the best attempt (highest score) at each design. Range is from 0 to 50 points.

Total Prediction

Sum of mother's predicted points for the five designs.

Discrepancy Score

This score is equal to the Prediction total minus Score total plus 50. The addition of 50 points converts all scores to positive numbers. If discrepancy scores are to be correlated with other variables, the prediction and score distributions should first be normalized before discrepancy scores are obtained.

Total Time (to nearest minute)

This seems to be the best measure of effort, since the total number of attempts is affected by the subjects' speed in making lines and by differences in how far the mothers will go with an imperfect figure before requesting a new board.

Teaching Measures

Practice Period Behavior

The following categories of behavior were used in coding the subjects for their use of the practice period.

Practice - No Practice

"No Practice" means that neither the mother nor the child attempted to use the board, and that the mother accepts or condones this. She does not try to practice or to get the child to do so. They essentially ignore the board.

Child Practices - Child Does Not Practice

The purpose here is to determine those cases where the mother alone uses the board. She either plays with it herself or demonstrates it to the child, but she does not allow the child to use it himself. Another situation that is relevant here is the case where the child ignores or resists the mother completely so that he never actually practices (follows a direction). Here the mother lacks sufficient control over the child to be able to institute a practice session.

Mother Structures - Child Structures

The basic question here is: does the mother express commands or expectations to the child regarding what she expects him to do? The child is structuring when:

(a) He plays alone with the board, with the mother's tacit approval.

(b) He begins giving directions to the mother, and the mother follows them without giving any of her own.

The following situations are scored as cases where the mother structures:

(a) When the child alone plays with the board, but the mother directs his lines.

(b) When the child gives directions but the mother does, too. (Mother allows him to direct but will correct him or supercede his directions if necessary.) Here the mother is encouraging the child and allowing him some autonomy, but she retains the basic control.

Alternatives Under "Mother Structures": emphasis on drawing figures

For categories 1 through 3 below, the mothers are concerned about drawing figures and attempt to do so by guiding or directing the child. They are not satisfied with simply turning the button to make lines. "Practice" for these mothers means figure construction, not button turning. The mothers who are scored 4 and 5, on the other hand, are apparently satisfied with "turning the button" as the needed practice, since they typically do not guide the child's lines. Telling the child to reverse does not count as guiding if it is done only because the child has reached the edge of the board and does not know how to get the line to appear again.

1= Mother Explains and/or Demonstrates the Board. Here the mother shows the child the relationship between the way the knob is turned (described as "toward you" or "this way", etc.) and the direction of the line on the board. Then the mother directs the child, "calling" these instructions. Another example which belongs here is when the mother does not give a complete or formal explanation but she predominantly directs the child by twirling her hand or by turning the child's button to start him. These are considered "demonstrations." If the mother turns the child's button herself (rather than let the child do it) or if she turns it only to get it away from the edge, this is NOT demonstration.

2= Mother Uses Called Directions. This includes cases where the child is already familiar with the board and cases where the mother directs him AS IF he were. "Called Directions" means that the mother DOES NOT explain or demonstrate the knob-line relationship but nevertheless gives specific directions ("Now you make the top;" "Now go up"). The mother's directions are purely verbal. If the mother twirls her hand to direct or turns the child's button to get him started, she is demonstrating, not calling.

3= Mother Tells Child to Start, Stop, and Reverse. Here the emphasis is less clearly on figure drawing and more on button turning than in the above. In guiding the child the mother does not tell him which way to turn BEFORE he turns. She simply tells him to turn. Then, if he goes the wrong way, she tells him to reverse. The mother may or may not label the figures they draw. Usually she tells the child only to the end. The point is that the child is not told to make a specific line; he is instead told only to turn. The direction of turning is not specified until after he begins and is only implied if he goes in the "correct" direction. Regardless of the number or complexity of figures drawn, the rating is 3 if the mother sticks to this trial and error approach.

Alternatives Under "Mother Structures": emphasis on turning the buttons

4= Mother and Child Take Non-specified Turns. Here the mother does not guide the direction of the child's lines, even after the fact. She insists only that the child refrain from turning while she turns. Otherwise, she is satisfied with the child's lines, regardless of their direction. The child, in effect, never learns that a line should go one way and not the other. If the mother should tell the child to reverse only to get him away from the edge of the board but does not guide him otherwise, the rating is still 4 and not 3.

5= Mother and Child Turn Simultaneously. Here the mother demands only that the child turn the button. She seems satisfied as long as the child makes lines, any lines, on the board. The following instructions to the child do not change the rating of 5:

(a) The mother tells the child to reverse because he has reached the edge of the board.
(b) She tells him to stop because she wants to shake out the board.
(c) They take turns briefly but apparently by chance (i.e., the mother doesn't demand it, and they then return to simultaneous turning)

Single Score for Practice Period

Since mothers often vary in their practice period behavior so that they fall into two or more of the categories, some method of assigning a single score must be used. Possible choices include the coding of sub-units of the practice period and averaging, coding the typical or modal behavior, and coding the highest level of behavior to appear. For the subjects of the Cognitive Environment Study the last method seemed most appropriate. In samples where the average level of ability or education of the subjects is higher, an alternative method may be preferred. In the Cognitive Environment Study each case was coded for the highest level category (lowest number on the list below) which applied at any time during the practice period.

1= Mother explains and/or demonstrates how to use the board
2= Mother uses called directions, assuming that the child knows which way to turn.
3= Mother tells child to start and stop, and to reverse if he goes the wrong way.
4= Mother and child take non-specified turns. Mother demands only that the child follow start-stop directions.
5= Mother and child typically turn simultaneously. Mother does not demand that they take turns.
*6= Child takes initiative in directing lines; mother follows. Mother does not attempt to teach child or to direct his lines.
*7= Child practices alone.
*8= Mother practices alone.
*9= No practice.

Specificity of Directions

For each line that the child makes, the mother's direction (if any) may be coded for presence or absence of specificity. "Specificity" here refers to whether the direction of the line to be made (up or down) or

---

*Categories 6-9 were combined under the heading "Mother does not structure Practice Period."

of the knob to be turned (clockwise or counterclockwise) is indicated by the mother before the child begins to turn his knob. Specificity is coded "present" if the mother makes any attempt to specify which direction the child is to turn. Examples:

"Go up."
"Turn toward Mommy."
"Go the same way as last time."
"Turn like this" (demonstrating with hand motions).
"Come to this line" (or "my finger").

Specificity is coded as "absent" when the mother merely tells the child to turn without giving any indication of direction, or when she says nothing at all. Examples:

"Okay."
"Your turn."
"Now make your line" (without pointing or gesturing).

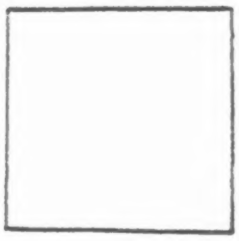
Specificity must occur before the child indicates which way he is going to turn his knob. Confirmatory feedback ("Okay, keep going" and correction ("No, the other way") do not count.

Since subjects vary in the number of lines made, scores for specificity in directions must be based on a constant subsample or expressed percentages before subjects can be compared. Our scores are based on a subsample of 25 directions (the total number of lines made by the child on the first attempt at each design; or, if the first attempt was incomplete, the first N lines he made on attempts at the design, where N is equal to the number of lines to be made by the child on that design). An alternative method would be to code every line made by the child and to compute the percentage preceded by specific directions from the mother.

Use of the Models

The design models (on $3\frac{3}{4}$" by 5" cards) were placed on the table by the tester and left for the mothers to manipulate at will. Mothers vary considerably in the degree to which they show the models to the child during figure construction. On each design the mother was coded for whether or not she showed the model to the child. "Showing" the model included holding it up for the child to see, pointing to it, or specifically telling him to look at it. The mother did not have to use the model for giving directions to be credited with showing it to the child; holding it up and saying, "We're making this," was sufficient. The score used was the total number of design models shown to the child (0-5, of a total of 5 designs).

DESIGN MODELS



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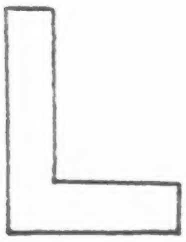

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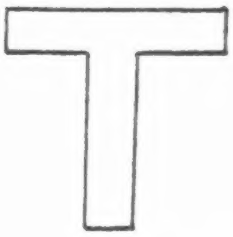

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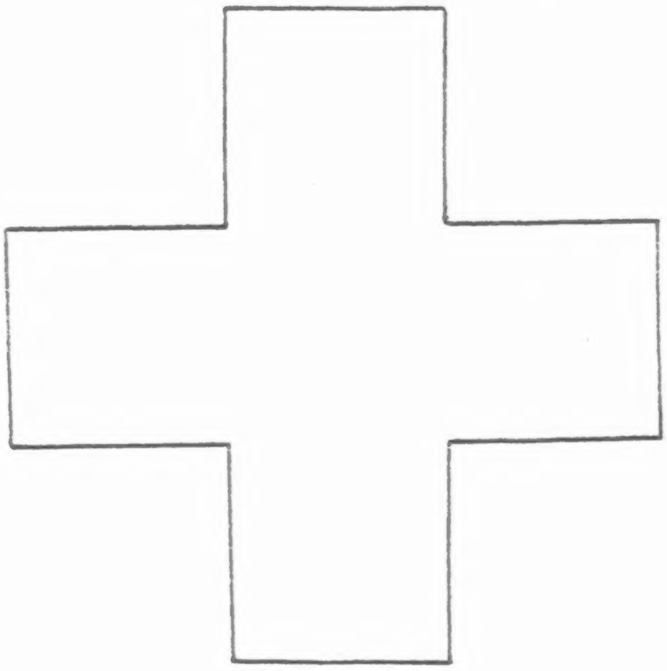

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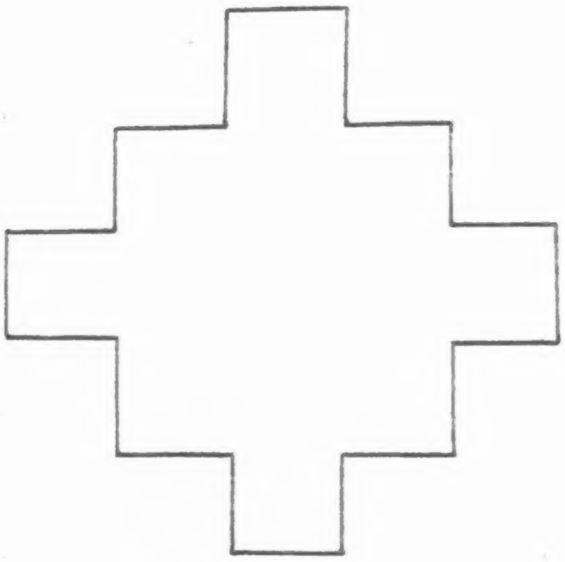

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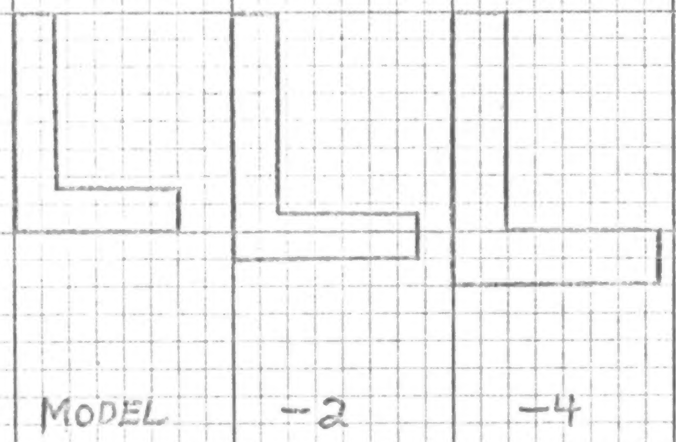
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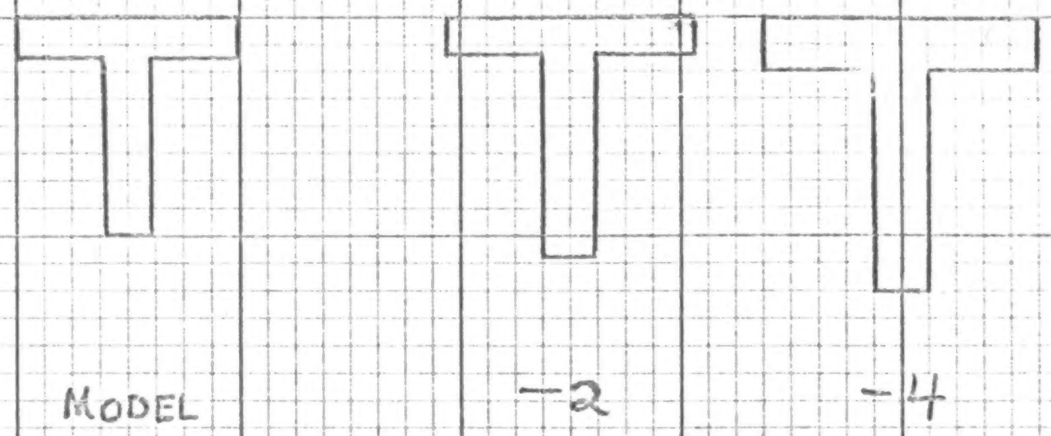
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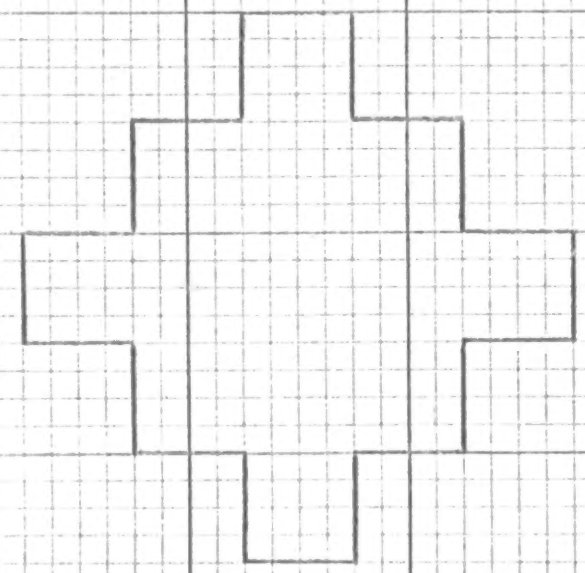

APPENDIX H

ADMINISTERING AND SCORING THE TOY SORTING TASK*

The toy sorting task was administered during the subjects' second visit to the university for testing and was the first of the three interaction tasks to be presented. It was relatively easier than the subsequent tasks and involved stimulus objects familiar to all the children. Consequently it was useful not only for eliciting mother-child interaction but also for allowing the subjects to become acclimated to the deliberate teaching situation and, more particularly, to cognitive sorting tasks. Following the completion of the toy sorting task the more difficult block sorting task was administered.

Materials

Nine toys and a partitioned board were used for this task. The board was a 9" by 18" brown slate divided into three sections by white lines (☐☐☐). The division of the board into three sections served to emphasize the distinctiveness of the three groups to be formed later. The toys used include three small chairs (dollhouse furniture), three plastic picnic spoons, and three plastic cars. The three types of objects were selected because they were assumed to be familiar to all the children. Among each type of toy (cars, chairs, spoons), one was red, one yellow, and one green. Thus, the nine toys could be sorted into three groups in either of two ways: by color (red toys, green toys, yellow toys) or by object (cars, chairs, spoons).

Procedure

The two sorting methods were taught to the mother while the child was out of the room. The specific instructions were as follows:

> (Begin with the board empty, and the toys in random order off the board.)
>
> (a) HERE ARE SOME TOYS. THERE ARE DIFFERENT WAYS THEY CAN BE PUT TOGETHER ON THE BOARD.
> (sort by object) THESE GO TOGETHER BECAUSE THEY'RE ALL . . . (pause). (Point to each group and elicit answer: spoons, chairs, trucks [cars].)
>
> (b) THE TOYS CAN BE PUT TOGETHER IN ANOTHER WAY, TOO. (Take toys off board)
> (sort by color; random placement within each section)
> THESE GO TOGETHER BECAUSE THEY'RE ALL . . . (pause)
> (Point to each--red, yellow, green)

*We wish to acknowledge the contribution of Mrs. Mildred Levine, who assumed primary responsibility for the design of this task as a research instrument.

I'D LIKE YOU TO TEACH _____ WHAT I HAVE TAUGHT YOU: TO PUT THE TOYS TOGETHER IN THESE TWO WAYS. I'LL BE OUT IN THE HALL WHILE YOU TEACH HIM. AFTER YOU'RE SURE HE UNDERSTANDS HOW TO PUT THE TOYS TOGETHER IN THESE TWO WAYS, AND KNOWS WHY THE TOYS IN EACH GROUP BELONG TOGETHER, CALL ME BACK INTO THE ROOM. I'LL ASK HIM TO PUT THE TOYS ON THE BOARD IN THE TWO WAYS YOU HAVE TAUGHT HIM . . . AND TO DO IT WITHOUT ANY HELP FROM ME OR FROM YOU. TAKE AS MUCH TIME AS YOU NEED TO TEACH HIM. WHEN YOU'VE FINISHED, BE SURE TO CALL ME BACK INTO THE ROOM.

The tester then brought in the child and left the room. The mother was allowed complete freedom of time and method. When she finished and summoned the tester, the child was asked to repeat the sorts:

(after tester is called back into the room: take toys off board and randomize)

(a) CAN YOU SHOW ME ONE OF THE WAYS TO PUT THE TOYS ON THE BOARD THAT YOUR MOTHER TAUGHT YOU?
(point to each group of toys; 3 in each sort)
THESE GO TOGETHER BECAUSE THEY'RE ALL . . . (spoons, chairs, trucks [cars]; red, yellow, green)

(b) NOW CAN YOU SHOW ME THE OTHER WAY TO PUT THE TOYS ON THE BOARD THAT YOUR MOTHER TAUGHT YOU?

In general, the child was allowed three trials at sorting (i.e., two chances to get the second sort, since the children can usually remember one of them).

The child's performance on the post-task test was scored later.

Scoring

Points were awarded for post-teaching performance on the following basis:

Criterion	Score
1. Sorts correctly into 3 groups by object (cars, chairs, spoons)	0 or 1
2. Partially explains object sort (names one or two groups)	0 or 1
3. Fully explains object sort (names all 3 groups)	0 or 1
4. Sorts correctly into 3 groups by color (red, yellow, green)	0 or 1
5. Partially explains color sort (names one or two groups)	0 or 1
6. Fully explains color sort (names all 3 groups)	0 or 1

In combination these scores yield a range from 0 (neither sort correctly formed) through 6 (both sorts correctly formed and fully explained). Subscores (sorting vs. verbalizing; object vs. color) may also be obtained. Points for verbalization were not awarded unless the child previously sorted correctly (exactly three groups, clearly differentiated).

Points were credited whenever the child met criteria without help, including cases where the child corrected earlier errors on his second chance and also cases where the child first responded correctly but then became confused under continued questioning. Responses following probing by the tester were allowed to raise the child's score (when they involved passing an additional criterion) but not to lower it (since probing may have induced confusion or inhibition).

Probing by the tester was restricted to rephrasing of the questions and attempts to clarify the child's intent when it was unclear whether he had finished an intended sort or which toys were intended to be in particular groups. Probing continued (when necessary) until the tester ascertained both which toys were considered as members of a group and the total number of groups.

5

APPENDIX I

ADMINISTERING AND SCORING THE BLOCK SORTING TASK*

The block sorting task was the project's major source of data for the measurement of the information-transmission aspects of maternal teaching. Cognitive sorting tasks are well-suited to this purpose because they impose a common goal upon all subjects (the sorting principle to be learned) but nevertheless allow for considerable variation in the means that may be employed to reach the goal. When the number of stimulus attributes (size, color, shape, etc.) and the number of gradations along each attribute are limited through experimental control, the thought processes (hypotheses) of the subjects may often be inferred from their manipulation of the stimuli. For this reason, sorting tasks are used to study thought processes in experiments in which information is presented in a predetermined, constant manner for each subject. They are also useful for the study of communication, when the subject is asked to teach someone else and is allowed complete freedom of method and time.

The block sorting task described in this manual was administered as the second of the three mother-child teaching situations presented during the subjects' second visit to the university. It followed the toy sorting task which was less complicated and which allowed the subjects to become acclimated to the teaching situation. The block sorting task combines several features which made it desirable for our research:

(a) It was unfamiliar to all subjects, so that none had had prior specific practice on it.
(b) The difficulty level is such that sufficient interaction data can be obtained from both the most and the least adequate subjects.
(c) It requires both verbal and non-verbal responses, and each response can be immediately recognized as either correct or incorrect.
(d) After the mother concluded her teaching, the child could be tested to obtain an objective measure of retention of the sorting principle and generalization to new stimuli.

Materials

Fourteen blocks and a partitioned board were used in this task. The board was of brown slate, 12" by 12", divided into quarters by perpendicular white lines (⊞). The board with its four sections served to emphasize the distinctiveness of the four groups of blocks.

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*We wish to acknowledge the contributions of Mrs. Mildred Levine, who assumed primary responsibility for the design of this task as a research instrument.

The fourteen blocks were all standard Playskool blocks, appropriately painted, lacquered, and marked. They differed on four attributes:

HEIGHT: Tall blocks were $3\frac{1}{2}$", short blocks were $1\frac{3}{4}$".
SHAPE: Cross-sections were either a $\frac{7}{8}$" circle or a $\frac{7}{8}$" by $1\frac{3}{4}$" rectangle.
COLOR: Blocks were painted red, yellow, blue, or green.
MARK: An X or an 0 was painted in white on each end of the block, about $\frac{3}{8}$" high.

The fourteen blocks included eight "original" blocks which formed the basic groups, four "extra" blocks which were to be placed into these groups, and two "test" blocks used only to test the child. The four "extra" blocks had a short pencil line on each end (in addition to the X or 0 mark) to facilitate identification. After the blocks were painted and marked, they were lacquered for protection. The blocks used were the following:

	HEIGHT	MARK	CROSS-SECTION SHAPE	COLOR
"Original" Blocks				
1	Tall	X	Round	Red
2.	Tall	X	Round	Blue
3.	Tall	0	Rectangular	Yellow
4	Tall	0	Rectangular	Green
5	Short	X	Round	Green
6.	Short	X	Rectangular	Red
7.	Short	0	Round	Yellow
8	Short	0	Rectangular	Blue
"Extra" Blocks				
1.	Tall	X	Rectangular	Green
2.	Tall	0	Round	Red
3.	Short	X	Round	Blue
4.	Short	0	Rectangular	Yellow
"Test" Blocks				
1.	Tall	X	Rectangular	Yellow
2.	Short	0	Rectangular	Red

Procedure

Instructions to the Mothers

The mothers were taught the task while the children were not present. A non-directive approach was developed to avoid suggesting that particular methods or terminology were either expected or preferred. Once the mother grasped the essentials, teaching was continued to an overlearning criterion of three consecutive errorless trials, each involving both placement of blocks and verbalization of the sorting principle. This was done to reduce the possibility that mothers would become confused later when teaching the children, and to help equate for initial differences in learning ability. The mother was initially shown the eight blocks, in four groups by height and mark. She was told:

> HERE ARE EIGHT BLOCKS THAT HAVE BEEN PUT INTO DIFFERENT GROUPS. THERE IS A REASON FOR THE BLOCKS BEING GROUPED IN THIS WAY, BUT BEFORE WE TRY TO FIND OUT WHAT THAT REASON IS,

I AM GOING TO SHOW YOU TWO OTHER WAYS IN WHICH THESE BLOCKS CAN BE GROUPED ON THE BOARD

(Tester forms a group of tall blocks and a group of short blocks) HERE THE BLOCKS HAVE BEEN PUT INTO TWO GROUPS HOW ARE ALL THE BLOCKS IN THIS GROUP ALIKE? (Tester points to short group, placing palm over level tops of blocks until correct response is given, then moves to tall group) ALL RIGHT, AND HOW ARE ALL THE BLOCKS IN THIS GROUP ALIKE?

(Tester places the four extra blocks near the mother) CAN YOU PLACE THESE BLOCKS IN THE GROUPS WHERE THEY BELONG? YOU PUT THESE TOGETHER BECAUSE THEY'RE ALL ? (Elicits answer for both groups)

(Tester now forms a group of blocks marked X and a group marked O) HERE THE BLOCKS HAVE BEEN PUT INTO TWO OTHER GROUPS HOW ARE ALL THE BLOCKS IN THIS GROUP ALIKE? (Points to X group until correct response is given) ALL RIGHT AND HOW ARE ALL THE BLOCKS IN THIS GROUP ALIKE? (Elicits correct answer for O group)

(Tester now forms four original groups using height and mark)
NOW WE'RE BACK TO THE GROUPS WE STARTED WITH HOW ARE THE BLOCKS IN THIS (short, X) GROUP ALIKE? (Elicits correct answer for each group, then gives extra blocks) CAN YOU PLACE THESE BLOCKS IN THE GROUPS WHERE THEY BELONG? (If subject makes a mistake, tester says THERE IS SOMETHING WRONG WITH THIS GROUP This continues until all groups are correct) YOU PUT THESE TOGETHER (short, X) BECAUSE THEY'RE ALL ? (Elicits both criteria and then continues to other groups)

(Removes extra blocks) YOU NOTICE THAT THESE EXTRA BLOCKS HAVE PENCIL MARKS ON THEM SO YOU CAN TELL THEM FROM THE OTHERS

NOW IF I WERE TO TAKE THE EIGHT BLOCKS OFF THE BOARD AND MIX THEM UP COULD YOU GET THE BLOCKS THAT BELONG TOGETHER BACK ON THE BOARD? IT DOESN'T MATTER WHAT SQUARE YOU PUT THEM IN SO LONG AS THE BLOCKS THAT BELONG TOGETHER ARE TOGETHER (Tester removes and mixes blocks If subject makes mistake, tester says, THERE'S SOMETHING WRONG WITH THIS GROUP This continues until subject has all groups correct) THAT'S RIGHT I JUST WANTED TO BE SURE THAT IF THE BLOCKS GET MIXED UP LATER WHEN YOU'RE TEACHING (child) THAT YOU CAN GET THEM BACK INTO THE RIGHT GROUPS EVERYTHING I'VE SHOWN YOU SO FAR WAS TO HELP YOU TO GET THE IDEA OF HOW THE BLOCKS ARE PUT INTO THESE FOUR GROUPS NOW WHAT I WANT YOU TO TEACH (child) IS HOW TO PLACE THESE EXTRA BLOCKS INTO THE RIGHT GROUPS ON THE BOARD WILL YOU PUT THESE EXTRA BLOCKS AGAIN WHERE THEY BELONG? (If subject errs tester says, THERE'S SOMETHING WRONG WITH THIS GROUP This continues until all groups are correct Tester then points to each group in turn, asking YOU PUT THESE TOGETHER BECAUSE THEY'RE ALL ? For each group she elicits both criteria from the mother.) NOW *THAT* IS WHAT I WANT YOU TO TEACH (*child*). TEACH HIM *HOW* TO PUT THE EXTRA BLOCKS INTO THESE GROUPS (pointing to each group), AND TEACH HIM *WHY* THE BLOCKS IN EACH GROUP BELONG TOGETHER. YOU DON'T HAVE TO TEACH (*child*) HOW TO START WITH THE EMPTY BOARD UNLESS YOU WANT TO. HE ONLY HAS TO LEARN *HOW* TO PLACE EXTRA BLOCKS IN THE RIGHT GROUPS, AND *WHY* THE BLOCKS IN EACH GROUP GO TOGETHER. (Tester removes the extra blocks from the board.)

YOU CAN TEACH HIM IN ANY WAY YOU LIKE. I'LL BE OUT IN THE HALL WHILE YOU TEACH HIM. WHEN HE UNDERSTANDS *HOW* TO PUT THE BLOCKS INTO THESE GROUPS, AND *WHY* THE BLOCKS IN EACH GROUP BELONG TOGETHER, CALL ME BACK INTO THE ROOM. WHEN I COME BACK INTO THE ROOM, I'LL GIVE HIM TWO *DIFFERENT* BLOCKS TO PLACE IN THESE GROUPS, AND I'LL ASK HIM TO TELL ME WHY HE PUT THEM WHERE HE DID. HE'LL HAVE TO DO THIS WITHOUT ANY HELP FROM ME OR FROM YOU. TAKE AS MUCH TIME AS YOU NEED TO TEACH HIM, AND YOU MAY TEACH HIM IN ANY WAY YOU LIKE. BE SURE TO CALL ME BACK INTO THE ROOM WHEN YOU ARE FINISHED. (Tester leaves eight blocks correctly sorted into four groups on the board, with the four extra blocks to one side.)

Teaching and Testing the Child

At this point the child was brought in and the tester left the room, remaining outside until summoned by the mother. When called back into the room, the tester removed the four extra blocks, made sure the four groups were present, and then presented two test blocks which neither subject had seen. The child was asked to place each block in the group where it belonged and was questioned about his reasons for placing them where he did. During this time the mother could support or encourage her child, but she was not allowed to give substantive help.

Scoring

The child's performance on the post-task test was later scored, with points awarded on the following basis:

	Criterion	Score
1.	Placement of short *O* test block in correct group	0 or 1
2.	Verbalization of *same height* or *short* in explaining placement	0 or 1
3.	Verbalization of *same mark*, *O*, or other descriptive tag used by mother when teaching (e.g., "cheerios") in explaining placement	0 or 1
4.	Placement of tall *X* test block in correct group	0 or 1
5.	Verbalization of same height or tall in explaining placement	0 or 1
6.	Verbalization of *same mark*, *X*, or other descriptive tag used by mother when teaching (e.g., "airplanes") in explaining placement	0 or 1

In combination these scores yield a range of 0 to 6 points, and subscores (first vs. second block, placement vs. verbalization) may also be obtained. Points for verbalization were awarded only if the child had placed the block correctly on the attribute in question (height or mark); i.e., verbal labels had to be correct to be counted.

During the test the tester presented each test block, saying, WHERE DOES THIS BLOCK GO? After placement she asked, WHY DOES IT GO THERE? If the child's placement and/or explanation was correct but incomplete, the tester would move the block to all other groups, asking, COULD IT GO HERE? WHY? After this, she would ask, WHERE IS THE BEST PLACE FOR IT TO GO? WHY?

The child was credited one point for each criterion he passed without help. Additions or corrections made in response to probing were credited. In general, responses during probing were allowed to raise the child's score but not to lower it, since probing may have induced confusion or inhibition in some children. Any synonyms for "height," "tall," "short," "X," "O," or "mark" were accepted in scoring verbalizations. Ambiguous responses which did not include a substantive label ("They look the same") were not credited for verbalization.

APPENDIX J

PROCEDURES FOR CODING MOTHER-CHILD INTERACTION*

The block sorting task provides a rich source of data for the study of mother-child interaction, and consequently it has been intensively analyzed in the Cognitive Environment Study. This manual includes the coding procedures from two independent coding analyses. The first, developed by Dr. J. David Jackson, divides the entire interaction into small message units (basically clauses) which are coded into several categories reflecting the type and content of the messages. The second, based on the dissertation of Dr. Jere Brophy, concentrates on selected aspects of the subjects' behavior and makes qualitative distinctions which could not be derived from the previous system. The two systems are complementary, each providing information not available from the other. All the information (measures) from both systems is ultimately used in a single analysis of the block sorting task, without distinction as to coding system. However, to simplify the presentation of the coding procedures, the two systems and the measures derived from them will be described separately in this manual. Following this, the subsequent use of the combined group of measures will be described.

Coding

Coding consisted of three processes:

1) Unitizing, which means breaking up the interaction into message units.
2) Rating, which refers to assigning a code to each aspect of the message unit.
3) Scoring, the performance measure which is obtained by the tester at the end of the interaction.

The message unit is the basic unit of analysis. Most simply, a message unit is composed of an attempt to transmit a single thought or idea from the mother to the child, along with the child's immediate reaction to that transmission. Such a thought might be task information, a question, a threat, or a reprimand.

In general, objective indicators such as syntax, a long pause, or the child's reply signal the end of a message unit. These and other indicators are discussed below. However, it should be remembered that these indicators are only clues. Since this is a semantic analysis, we must constantly be concerned with the thoughts transmitted. We rely on the coder's trained judgment--not on rules to be applied mechanically. The judgment required is similar to that made by raters in scoring a TAT or Rorschach or in carrying out a naturalistic observation. The final criterion is: what judgment would the majority of intelligent,

*We wish to acknowledge the work of Nancy Vogeler, Alan Fiske, and Gregory Kavka, who did much of the initial coding and who contributed many valuable suggestions for improving the coding procedures.

trained, and unbiased observers make about the units of this interaction. We do not pretend to understand what is going on in the head of the mother or child. We can only observe the overt behavior--in this case, the codes passing between two people. Observers trained in our system can ascertain the units of this communication process with a high degree of reliability.

In addition to remembering that the analysis is a semantic one, the coder should remember that the analysis is of a teacher-learner situation. The message units are primarily divided and rated from the standpoint of the mother as initiator. Thus, the child's response always indicates the end of a message unit. In rare cases the child may initiate a message unit after responding to the mother's message.

This form of unitizing is derived from our assumption about human communication. It deals only with dyadic communication down a status gradient; that is, two people of unequal status talking. The person with higher status is attempting to transmit information to the other. To transmit successfully, the person of superior status must (a) engage of motivate the person to attend, (b) present the information clearly, and (c) monitor the receiver's understanding of what was transmitted by setting up feedback opportunities. The codes which are described in this manual are designed to measure this process.

A Pause

A pause which lasts for some time is signaled by three dots on the typewritten manuscript. When rating a case, the coder must always listen to the interaction precisely, because some of the pauses that are in the interaction are not recorded by the transcriber in such a way. A pause as short as a person taking a breath is an excellent indication of the end of a message unit. The rationale for the time break as an indication of a break in meaning comes from the most elementary feature of any coding system; that is, that the larger the unit of meaning the longer the break between it and the next unit; thus we must pause briefly between speaking words so that people can understand them. The pauses are more likely to occur between phrases, and of course the pause is longer between different types of messages. Thus, one good clue to the end of a message unit is the length of time before the next message unit begins. This, like all the rules which follow, is not an absolute, but a guide.

Child Response

A response from the child always signals the end of a unit whether it is solicited or unsolicited; if it directly follows a mother's message it is considered part of the same message unit. The only time a child's statement is coded as a separate unit is when it follows his own response without any intervening message from the mother. For example:

Mother: This is tall.
Child: And has X on it./ I don't want to do this any more.

A response occurs when the mother sends a message and the child replies verbally or with some physical action. If the child merely remains passive, this does not necessarily end the unit. The child's response terminates a unit even in cases where the mother follows the child's response with a continuation of her earlier message. The rationale is that in spite of the fact that the mother intended to send a longer message, she was interrupted and had to reformulate her message after the child's response. Message units are primarily rated from the standpoint of the mother as initiator.

Syntax

Syntax is often a useful guide to meaning. A message unit will normally consist of a simple sentence with only one subject, verb, and direct object (although an unlimited number of indirect objects may be present). The subject may be understood from the preceding message. The simple sentence will be a unit unless other indicators call for divisions, such as when the child responds. Dependent clauses and dependent phrases are generally included in the same message unit. "We put this here because it is tall" is a single message unit. Independent clauses are usually separated. When the subject and verb of the second independent clause are implied by the preceding clause, each clause is rated as a separate message unit. For example, "Do you know your X's/ and your O's?" consists of two units. Independent clauses can generally be identified by a conjunction. For example, "This is an X block/ and this is an O block" would be coded as two message units. The one conjunction which does not follow this rule is "or" which always joins two dependent clauses which must be coded as a single message. Prepositional or adverbial phrases or clauses are not coded as separate message units, as in "The block is small with an X," or "Look at the block on the board." Exceptions to these rules can be made, however, on the basis of timing.

Context

All the rules for unitizing must be used in terms of the meaning given by the context. This applies only to the context which precedes the statement; the decision to unitize is never based on what the mother or child says at a later point in the interaction. Meaning must be in terms of what an objective observer would understand having heard the interaction which had taken place up to this point. This is the second reason for listening to the tape and making the designation of message units while listening.

Incomplete Thought

A message can be coded as a unit even though it does not represent a complete thought, when such a message is interrupted by the other speaker. Thus, for example, "Now I want you to" interrupted by the child saying "I don't want to play this" would be a message unit. When the dependent clause is interrupted, the principal clause is coded as a separate unit and the dependent clause is coded as an interrupted message. This is in contrast to the general procedure of unitizing the dependent clause in the same unit as the independent. The rationale here is that the meaning has been received for the principal clause and is therefore not incomplete even though the dependent clause or phrase is incomplete.

Repeat

When a word or phrase is repeated verbatim with no break and no change in the child's behavior, the repetitions are not separated. If "Stop, stop, stop" is said without an interruption by the mother pausing or by the child making some comment or action, it is coded as one unit. The rationale for this is that no new information is added by the repetition of this phrase even though the number of times it is stated does tend to add emphasis. Emphasis is also added by tone and by volume which are not picked up in the analysis in its present state; thus, from a semantic point of view repetition of identical words or phrases without a pause or interruption is coded as a single message unit. If a message is repeated, it is necessary to establish whether any feedback, physical or verbal, was given by the child after the first statement. If a response was actually given by the child, the second statement may be Feedback Reply, and two messages are involved. If there was no intervening response, however, the repeated statement will be scored as one message since there is no additional information carried by the repetition.

When the speaker qualifies with a phrase which does not change the meaning, this phrase is included in the preceding message unit. For example, "Reminds me of seeing this before, like this before" is coded as one message unit. When a phrase changes the meaning, it is coded separately. "This is an X--I mean an O" is coded as two units.

Verbal Tic

Many words such as "now," "see," and "OK" appear so frequently as to be almost meaningless terms. The solution to analyzing these troublesome words is first to identify whether they come at the beginning or the end of a message unit. They are almost never coded separately when they precede a message unit. This type of language may be a mannerism which is unconsciously injected into all conversations, or it may function as a noise-making technique to hold the channel open to prevent interruption by the other person, or it may be autistic primitive speech (the person is merely talking to himself, for instance, "let's see"). Words with these same features may be unitized separately when they appear at the end of a message unit. The words "see?" or "OK?" are often coded as a separate message unit at the end of a preceding unit. They are then rated as questions with no discriminations. When a mother has an "interrogative style," her questions should be broken into separate units rather than be considered verbal tics. The clue to the difference between an interrogative style and a tic would appear to be that in an interrogative style many different forms of questioning are used, while in the case of a verbal tic several examples of the same word will be used on the same page in precisely the same place at the end of the message unit. The rater should ask as always, what do I understand from the mother's overt behavior at this point? Is it questioning (unitized separately); or is it a mannerism, a noise-making device, or autistic speech (or verbal tic and not unitized separately)?

Miscellaneous

A message unit may be primarily physical or primarily verbal, but most units will contain both elements. Distinctions between the two must be made in the rating (this is explained below). A physical gesture may cover more than one message unit. When a mother holds up a block and describes its characteristics, a point is scored for each relevant message. A gesture which occurs during a message usually does not end the message but is considered to accompany the verbal communication and is rated as part of the whole unit. The only exception might be in the case of demonstrations which will be described below. A message unit is generally not longer than one breath. The only exception is when a sentence is repeated.

Occasionally message units are totally unintelligible. In such cases, they are coded as "unintelligible" under the variables of Verbal Messages and Feedback Given. All other variables are not coded.

In rare cases, communication may be nonverbal; for example, the mother might give a command to which the child may give an incorrect physical response. The observer notes that the mother looked sternly at the child, causing him to place the block in the correct place. The mother's stern glance initiates a new message unit. However, if the child's first response is incorrect and then his next response is a spontaneous correction with no intervening statement from the mother, one message unit is rated, as correct. If the child responds correctly, then spontaneously makes an incorrect response, one message unit is rated as a physical incorrect. The intention in coding this way is not to pick up the thought processes of the child but only to record his actual physical response.

Task-specific vs. Task-oriented Messages

It is necessary to distinguish between task-specific and task-oriented messages to facilitate the coding. Task-specific message units are those in which specific information about any of the elements of the field which are essential to completion of the task is given by either the mother or the child. Task-oriented message units are those which contain general information about the task and the objects under consideration. For example, in the block sorting task any messages relating to characteristics of the blocks such as height and mark would be task-specific.

Coding Categories

Types of Verbal Messages

Messages may be thought of as grouped by task specificity. They may also be thought of as being of three primary types: those which are directed at informing the child, those which request feedback, and those which reply to feedback. There are also two secondary types of ratings used for special situations when the action is initiated by the child or when the attempted verbal message is incomplete. These types of message are general rather than hard and fast. For instance, engaging and gearing, while generally intended to impart information, are sometimes used by the mother in response to tune-out by the child. Such messages might also be intended to elicit certain responses from the child. In this sense there is a coordination between the actions of mother and child. In any case, the main emphasis falls into the primary types set forth above.

No Verbal Message

This rating is used in only two situations: when the child initiates a message while the mother says nothing, or when the mother undertakes a demonstration after the completion of the previous message.

Task-Informing

This is a message in which the mother lectures or imparts any specific information about the task. When informing statements focus, informing takes precedence over focusing; informing also takes precedence over gearing. All feedback requests take precedence over informing (see below) as do replies to feedback.

Engaging

This is a non-task-specific but task-oriented message used to involve the child in the task, generally by using some kind of rewarding technique. One example of this kind of message is "This is a game like the one we have at home." These messages also occur when the mother talks with the child about non-task matters during the course of the interaction. For example, talking about lunch or going home, or a conversation about the tester might all be scored in this category if they are directly motivating. Other such non-task conversation is rated non-task communication. When the child tunes out and the mother essentially follows his lead with the intention of regaining his cooperation, the ensuing messages are primarily aimed at motivation. They are scored in this category.

Gearing

This is a general statement used by the mother to develop a set in the child's mind for the task which will follow. Such a statement orients the child and maintains his interest--that is, tells the child what is to be done--but it neither gives specific information nor tells how the task is to be done. Two examples are: "The game is to put the blocks in a special way." "Now we'll do it again." Note: messages in this category need not be statements. A question such as "Shall we do it again?" might also be scored as gearing.

Command-Physical

Command messages are task-specific, and they take precedence over all others. Whether or not a message contains new information, if it contains a command that the child do something, it is rated as a command. A physical command is scored whenever the mother demands that the child do anything physical. It must be noted that this category is used only when more than a visual action is required by the child. A visual action alone is scored under focusing or verbal point, as is a compound sentence in which the first unit contains no meaningful discrimination: "Pick it up/ and put it where it goes." The second message unit would be rated for verbal message, but the first unit is rated as focusing.

Command-Verbal

Here the command is that the child respond verbally. This is distinguished from a question in that the child has no option in his reply. A statement beginning "Tell me . . . " is generally in this class. The content might range from a simple request for affirmation of understanding to requiring specifics about the placement of the blocks.

Question-Physical

This rating refers to the mother's requesting the child to do something physical ("Would you give me the block with the X on it?" or "Can you show me the tall X?").

Question-Verbal

This is used when the child is requested to respond verbally. Again, this may range from a simple yes/no answer to a full explanation.

Affirmative Reply to Feedback

In this case the mother replies to the feedback received in the previous task-specific message with a statement of approval, confirmation, or praise. Generally, only the first message following the feedback will be scored as a reply, succeeding statements being placed in the categories into which they would have been placed had there been no feedback. The only exception occurs when the mother follows with a repetition of the child's message. In such cases the second message must be coded for discriminations.

A statement which is neither clearly positive nor negative should be scored by the predominant nature of the reply. A statement which is truly half positive and half negative which cannot be broken down should be scored as positive, such as "That's almost right."

When a mother follows a child's feedback with information which also affirms, the unit is rated as affirmative and rated for discriminations. Only the first such message following a reply will be rated as affirmative. However, a standard affirmative reply such as "Yes" or "That's right" may be rated affirmative in addition. For example:

Child: "That's a circle."
Mother: "A circle./ Yes."

The mother's reply would be broken into two message units, both rated affirmative and the first rated for discriminations to indicate its information content. Thus all message units rated in this category which contain task-specific information must be rated for discriminations. (Discriminations are described below.)

Negative Reply to Feedback

This is the reply in which the mother tells the child his response was incorrect. It may be a statement of fact or blame, or a critical comment. It is always task-specific. If the mother does not qualify the "no" with new information, the words accompanying the "no" are included in the message unit. For example, "No, not that."

When the mother follows incorrect feedback with information which tells the child his response was incorrect, this message is rated as a negative reply to feedback and is rated for discriminations. If the mother replies with several consecutive units which have information but are a negative reply to feedback, the first unit is rated as a negative reply and the other units are rated as informing.

Informing-Reply

Here the mother merely answers a task-specific or task-oriented question put to her by the child. Care must be taken to distinguish information elicited by the child from that initiated by the mother.

Control

Here the mother is attempting to obtain the child's cooperation, or direct his action through some implied punishment. It is this element of implied punishment or threat that generally distinguishes this rating. It is scored as a response to the child's behavior although it is conceivable that the mother might use this mode as a preventative. Messages in this category imply the mother wants the child to do things precisely the way she tells him to. It discourages initiative on the part of the child. Control messages need not be task-oriented. For example, "No, wait" would be coded as a negative, and then the second message would be coded as a control. Control takes precedence over focusing and informing.

Incomplete or Interrupted Sentence

This class is used in two instances: when the mother is interrupted by the child, or when she changes her mind in mid-phrase and turns to a new sentence to complete her thought. This is not a catch-all category to be used when none of the above apply. It is, rather, an attempt to get at the number of changes of direction of the mother's thought as well as to account for the verbal meanderings which crop up in normal speech. "Er, well . . . " might be scored in this category.

Focus or Verbal Point

This category is used when the mother attempts to focus the child's attention on a specific portion of the field. Care should be taken to distinguish this from commands on the one hand and from control on the other. The intention of the speaker is to have the child orient himself. This type of message is never a question. Questions such as "See that?" are coded as questions with no discriminations. Because of the nature of focusing, a focus unit generally precedes the command, information, or question. It seems unlikely that one would focus after giving information. According to this rationale, in a statement such as "These go here,/ see?" the second message unit is rated as a question, not a focus. Focuses can be differentiated from informing in that they give very little specific information. They can be distinguished from commands and engaging because there is little positive or negative reward implied in them. Focus is not used to change the child's attention but merely to direct it. Focuses may often be accompanied by a physical point, but this is not necessary.

Often very little information is implied in a focusing type of message unit; nevertheless, this message, by convention, will be unitized separately. In the example, "Take this/ and put it where it goes," the first phrase is coded as a focus. This conforms with the syntactic procedure for dividing message units.

Non-task Communication

This type of communication occurs when the mother's message is "away" from the task situation. She may follow her child's non-task communication or she may initiate non-task communication. It is distinguished from engaging in that the mother in this type of message does not attempt to motivate the child toward the task. A good question to ask in coding a non-task as opposed to engaging message would be, "Does this statement attempt to get the child to work on the task?" If it does not, as in the example "That's the telephone," then it is non-task communication. This rating takes precedence over informing when the information contained is non-task-oriented. This rating also occurs when the mother engages in conversation with the tester, whether to ask a question or to respond.

Unintelligible

This category is used when the mother initiates a message that can not be understood but the child responds verbally and understandably in the same message unit. If both the mother's and child's statements are unintelligible, this category should still be used--even though all other variables are scored as "no message."

Generally the following rules of precedence apply: control over informing or focus; informing over gearing; engaging over non-task communication; feedback requests or feedback replies over informing.

Physical Messages - Mother

This behavior is generally scored through interpretation of the observation. At times, a gesture is not specifically noted, but must be inferred from the verbal message. One must not assume that there is no action occurring simply because it is not specified. The emphasis in these ratings is on task-specific messages. Others (except controls) are not scored.

No Message

This class is scored only when it is clear that no task-related gesture is actually occurring. If the mother is holding a block throughout a series of messages, "points" are scored for all the messages even though no new gesture occurs. This category is, of course, used when the mother's gestures are in no way related to the task.

Point

This class includes all manual actions of the mother which are accompanied by verbalization. It is an attempt to clarify the task-specific verbal message. Note: if the mother demonstrates while using verbal clues, her demonstration is nevertheless scored as a "point." Thus the class includes actual points, holding a block, or placing it on the board. A prolonged point is rated for every relevant message unit.

A message beginning "This is . . . " is generally assumed to be accompanied by a point. The important fact is that when a point accompanies a verbal message, both the physical and verbal actions are essential in transmitting the message.

Physical Restriction

This class is used only when the mother actually touches or reaches for the child or holds the test materials from him in an attempt to restrain his actions. It will generally be accompanied by a rating of engaging control, or possibly gearing in the verbal message category. This rating is made for every message to which it applies if the action is prolonged. One must be careful, however, to determine when a physical restriction changes to a point. Physical restrictions are used to orient the child to the task activity when he is either inattentive or performing incorrectly. By holding back a block, the mother may keep the child from placing it incorrectly. As soon as she tells him where it goes, however, the action becomes a point.

Demonstration

This is a series of task-specific actions carried out by the mother but not accompanied by verbal task-specific cues. Thus, the mother may say such things as "I'm going to do this, then this." The rationale here is that the demonstration should be coded because the major amount of information is being transmitted by physical actions rather than words. If verbal task-specific cues are given along with a vivid demonstration, the message unit is coded as informing because, we feel, the verbal cues are much more potent in teaching.

Feedback

This category is always scored, regardless of the nature of the message unit. The child is always giving information to the mother, and this information can change at any time. The categories below are, therefore, designed to be exhaustive of all possibilities for feedback from the child. Except where noted, the classes are task-specific.

Neutral

This class refers to those situations in which the child is not sending any overt signals to the mother. He is not tuning out, although his attention may not be total. The child is open for communication, but the essential point is that the mother is not receiving any specific indication of the child's participation in the task. This rating is also used when the child fails to reply to a feedback request.

Negative Task Involvement

In this case the child behaves physically and verbally by in effect changing the subject or tuning out. The mother receives the information that the child is not task-involved and that the mother is not communicating. The child's message may be a negative verbal response to the mother, i.e., the child's response of "No" to the mother's question, "Do you want to do it?" It may be initiated by the child himself; i.e., "I don't want to play this anymore." It may be behavior such as turning away or playing with the blocks.

It should be noted that the next six feedback categories have to do with the correctness of the child's verbal or physical task-specific feedback. Physical responses take precedence over verbal responses. The criterion for deciding whether the feedback was correct, intermediate, or incorrect is what the rater judges the mother's expectation to be from what she said immediately preceding this or earlier in the interaction. For example, the mother has introduced the concepts of height and mark in the immediate preceding context. She then points to a block: "What is this?" The child gives only one concept: "It is tall." If the mother's expectation seemed to be for "tall X," the child's response would be rated as an intermediate.

Verbal Affirmative

Here the child demonstrates that he understands the situation. Responses in this class are correct statements about the task. Again, the judgment of what is correct is made in terms of what the observer believes is an objectively correct answer to a question or command. (Note: all responses in this class are task-oriented. Scoring a non-task statement will be described in another category below.) When a correct verbal response accompanies a physical response, the physical response takes precedence. Therefore, responses rated as verbal are not generally accompanied by task-related physical action. Verbal responses which accompany behavior are, however, rated for the concepts they contain, although the feedback message is rated in the physical categories. It is possible, in rare cases, that the child will nod or point in response to a question. In such cases this category is used when the question was task-specific and the gesture is definitive. If the nod indicates simple agreement, it is coded verbal indefinite. In such cases the gesture is a simple substitute for a word. A zero is then scored for number of child's words and for concepts.

Verbal Intermediate

In this case the child indicates that he partly understands the task. This information may be initiated by him, or it may be a partially incorrect response to a question. In this case, it is also possible that the child may not actually speak his response. Such cases, which are very unusual, should be handled as described above.

Verbal Negative

Here the verbal feedback is generally task-oriented in such a way that the child indicates he does not understand what is going on. It may be an incorrect response or an "I don't know." In any case, it tells the mother that there is something wrong with her communication. Cases in which the child does not respond to a question or command will not be rated in this class. Again, in this case it is possible that a nod or shrug must be rated as verbal feedback. Rating of such situations is described above.

Physical Action-Correct

This class is used primarily in response to requests from the mother. The expected physical response might be accompanied by a verbalization. However, we assume that the physical response is more potent. Therefore, such double messages are usually scored in this category. The only exception would be when the concept is verbally elaborated while the physical action is minimal. The range of behavior in this class includes correct placement of a block as well as choosing the proper block from a group.

New message units should not be manufactured just to make this rating. Thus, if the mother says, "Place the X's together," the fact that the child chooses to pick them up one at a time rather than scooping them all in one movement should not be distinguished by separate message units. This type of rating is tapped by discriminations which are described later. Physical action-correct is a feedback code which tells whether the child, in the opinion of the rater, responded to the mother's request correctly, in an intermediate way, or incorrectly; it does not reflect the number of physical notions involved. However, if a global command is given such as "Do that again," and the child carries out major steps by first separating the blocks by mark and then separating each of the groups by height, these separate thoughtful steps would be coded as separate units.

Physical Action-Intermediate

This is used when the action is part correct and part incorrect. For cases where verbal responses occur also, see the previous and following categories.

Physical Action-Incorrect

This category is used when a child picks up the wrong block or places one incorrectly. Again, we expect little verbalization to accompany these actions (see above). If the child should make a correct statement while performing the action incorrectly, this category is generally used. Only if the statement is quite explicit and detailed while the action is minimal would the message be scored as intermediate.

Requests Task-specific Information

In this case the child requests further information about the task, presumably to increase his understanding.

Responds to Non-task-oriented Message

This category is scored only when both mother and child are essentially "away" from the task situation.

Volunteers Unsolicited Task-specific Information

This is not feedback in the strictest sense, but it does give the mother information about the child's understanding or progress. The child is, in a sense, taking over the role of teacher by volunteering task-specific information. In this sense he is probably jumping ahead of the situation. Note that to be rated in this class, the information must be relevant. It may refer to a different aspect of the situation, or it may change the subject or stop the communication.

Verbal Indefinite-Positive Task Involvement

This class is scored whenever the child indicates that he is happy or agreeable with the task situation. It is rated only in conjunction with informing or non-task-specific messages from the mother. The child's response, however, does not indicate his level of understanding. This type of message essentially lets the mother know that the child is involved and that she may concentrate her efforts on communicating the task. This could be a physical act, such as a nod, or merely picking up the blocks but not placing them. This category is a converse of the negative task involvement category. It must be distinguished from verbal correct or physical correct because verbal indefinite-positive task involvement means that the child makes a response which defies the rater's ability to determine whether he understands what he is doing. If the mother asked, "Is this an X block?" and the child replied, "I don't know," it would be coded by convention as a verbal negative. Also by convention, one primitive speech pattern for children should be coded in this category: when the child echoes the last few words of the mother, for instance, "Show me a tall X," to which the child replies, "a tall X."

Unintelligible

This category is used when the child's feedback response cannot be understood, even if the mother opens the message unit with an understood message. Again, as in an unintelligible verbal message, if both the mother's and the child's statements are unintelligible, this category should be used even though all other variables are scored zero.

Attention

These ratings are measures of the child's involvement with his mother. They do not necessarily indicate his involvement with the task. This point must be carefully noted. If the child's attention wanes and he begins to tune out, the mother may attempt to motivate him through engaging or control. His attention may or may not be elicited. The mother may follow him in a conversation which is non-task oriented. The coding in other categories will reflect this.

The ratings in this group can best be made by reading the observation, since the child may not be responding verbally. A rating must be made for every message unit. The rating will be repeated until a change is noted by the observer or until a verbal response on the transcript suggests a change in the child's attention.

Full Attention

This class refers to the child's sitting quietly, watching and listening to the mother. He might be fingering a block or engaged in some other non-involving motor activity and still be rated full attention. He may also, of course, be responding to the mother or volunteering task-related information. In any case, to give this rating, there should be little doubt that the child is primarily engaged in trying to follow the messages of the mother.

Part Attention

In this case, the child appears to be listening to the mother but may be distracted, e.g , attempting to play, impatiently kicking, or tapping his finger To use this rating, the observer must decide whether the child is still at least partially watching and listening to what the mother is doing. This is what distinguishes part attention from no attention. The distinction of part attention from full attention may be partially subjective. It might be best made by asking, "Would the average teacher be satisfied with this amount of attention?" If the answer is "no," a rating of part attention is given. While the child's eye activity and the amount of distracting noises are indicators of attention, no single criterion can be used. We must rely on the observer to indicate when there is actually a change in the attention of the child. As in the above case, the same rating continues to be made until a change is noted.

No Attention-Tune Out

In this case the child has completely tuned out. He may turn from the table, begin to actively play with the blocks, or try to talk the mother into doing something else. A rating for attention must always be made in connection with verbal messages. As a criterion question, the observer might ask whether, if the child were interrupted at this point, he would be able to repeat the last message from the mother.

Discrimination

Discrimination refers to cognitive organization of the task-specific qualities of the objects. It does not involve merely perceptual distinctions the child might make about things that are not related to the task objects. Two distinctions must be clearly in mind if this category is to be coded correctly: principles of servo-theory on the one hand, and the schema for organizing information proposed by MacKay on the other. In servo-theory, one distinguishes between the perception of the stimulus and the decision rules by which the mechanism acts on what is perceived. The implication when the mother is viewed as a servo-mechanism is that the mother's informing messages are attempts to direct the perception of the child, while her commanding and questioning messages are attempts to develop decision rules within the child. To receive information, the child must make perceptual discriminations, but to respond to a feedback request (command or question) he must develop decision rules; that is, he must discriminate more actively. Thus, informing messages are coded less stringently for discriminations than are commands or questions. An informing statement which uses the same concepts as does a feedback request will be coded for discriminations, while the command or question will not be: "This is a little X" vs. "Is this a little X?" When a question can be answered simply by yes or no, we generally consider that active discrimination was not required. Thus, coding informing statements for discriminations requires different criteria than coding questions for discriminations. Discriminations in questions relate to what the child must discriminate to answer. Discriminations in informing relate to what the child must discriminate in order to understand. If a question requires a simple yes or no answer, there are no discriminations required.

MacKay has distinguished two types of information. Applied to our situation, a logon is a dimension of meaning such as height or mark. A metron is a division or a section along that dimension of meaning. Thus, marks in the case of the block sorting task are divided into X's and O's, while height can be divided into two metrons, tall and short. For example, "This is an X block" is one discrimination because the child must be able to distinguish an X block from all other blocks. If, however, the mother says, "This is a block," no discriminations would be required of the child because this does not require a task-specific discrimination. Therefore, only task-specific information in terms of the two basic dimensions of the block sorting task (the logons of height and mark) and of the two metrons in each dimension (tall/short and X/O) are used in discrimination rating. The rating is made not on the basis of how much evidence the child gives of actually discriminating, but on what an objective third person who had been following the interaction from the beginning would be led to discriminate if he heard the last message unit spoken. The question is: what does this message call for in the way of discriminations, given the preceding messages? Metrons and logons need not be specifically mentioned if they are implied in the immediately preceding message units. In fact, it is by moving from a unit where the metron or logon is mentioned to a unit which combines them that the process of bonding occurs. Bonding occurs when the mother takes two metrons on a logon and shows that they are both the same logon or when she takes two logons, or two metrons from different logons, and places them together. We believe this is an important feature in teaching. For example, "Now these two are very tall/ they both have crosses on the top;/ that's why they are standing together" consists of one metron on one logon bonded to another metron and another logon. The first message has one metron discrimination, and although the two metrons from different logons are not bonded explicitly until the third message unit, bonding is implicit in the second, and both the second and third units would receive a code of repeated bonding for discriminations. In the example "This is an X,/ and it goes with the tall ones." the first message unit would be one discrimination and the second, two discriminations.

Discriminations are coded only after certain verbal messages: task informing, commands, questions, and informing-reply. In cases where an affirmative or negative reply to feedback contains information, it is coded for discriminations. The categories are as follows:

No Discriminations

No discriminations is when the mother asks a question which is not task-specific or gives a command which is not task-specific. That is, the statement or question does not require task-specific discriminations to answer it. For example, "Put them there (points)" requires no discriminations in the way they have been defined in terms of task-specificity. However, "That is an X block" would require one discrimination. The reason for saying that perceptual discriminations are less stringent than those dealing with commands or questions can be demonstrated by the command "Put that X block there (point)," which would not have a discrimination since all elements of the field would be specified.

Metron

For a unit to be given a metron rating, there must be one division along a single dimension and then the message unit, e.g., "This is tall."

Two Metrons on the Same Logon

Here two metrons are mentioned or implied which are on the same logon. For example, "Is this an X or an 0?" mentions both metrons and the logon of mark.

Bonding

Bonding occurs when two logons or two metrons on different logons or a metron and a different logon are mentioned or implied in a message. In the typical example of bonding, two metrons of different logons are mentioned or implied in the same message unit--for example, "Where does the tall X go?" The coder must be careful that this discrimination is not missed when it is implied by previous message units rather than is explicit in the unit. In the example "This is tall/ and this has an X on the top/ so that is why they go together," the last unit is rated as bonding based on the implication of the two previous units.

One Logon

One logon such as "Sort them by height" is mentioned.

Two Logons

This is a rather rare situation, such as when the mother says, "Height and mark are important."

One Metron Requiring the Child to Select Two or More Blocks

The distinction in this coding is to give us the ability to analyze the sequence in which the mother makes a single command or informs and the child must make several moves to execute it properly. It will be recalled that in the coding of the feedback, these are not coded as separate message units since they would inflate the number of units artificially. This information is important, since asking the child to perform several actions sequentially must be recorded in the rating for discriminations. This discrimination category and those which follow provide the opportunity to do this. In a statement such as "Give me all the 0's," the coder knows that there is more than one 0 on the board and that the child should perform a discrimination of one metron repeatedly. If the one metron discrimination is to be made by the child two or more times in terms of the message that is sent by the mother, the discrimination is coded in this category. An example of an informing message coded in the category would be "The X's go together." However, "Are these X's?" is coded no discriminations because it requires a yes or no answer.

One Logor Repeated

If the situation requires repeated action similar to the category above but in terms of a logon, then this score is given for discriminations. This might be the case where the mother says, "Sort them by height."

Repeated Bonding

The discriminations which would be rated as bonding above are given this score if they call for repeated bonding by the child. As in the two previous codes, the child is asked to make repeated discriminations; for example, "Put the tall O's together."

Global

This rating is given when a discrimination is required but when it is impossible for a third person objectively reading the transcript and listening to the tape to ascertain how many discriminations are required to complete the task successfully, for example, "Now you do it." In a sequence of questions about the same metron or logon, it may be necessary to rate the first question as global. If the child answers this first question with a discrete number of discriminations and the mother indicates that he is correct, then the next question, if it is phrased similarly to the first, will not be coded global but will be given the number of discriminations indicated by the child's correct performance. For example, the mother's question "What is this?" would be rated as global discrimination. If the child answers "An X" and the mother says "Right," then when the mother asks, "What is this?", it will be coded as one discrimination rather than global because semantically it is clear that the mother wants the child to make one discrimination, "X".

Number of Mother's Words

This category refers merely to the total number of words used by the mother in a single message unit. Contractions are counted as two separate words.

Number of Child's Words

This category refers merely to the total number of words used by the child within a single message unit. Again, contractions are counted as two separate words.

Derivation of Measures from the Coding Analysis of Message Units

The coding analysis described above provided the basis for several measures of maternal teaching and child response during the block sorting task. Measures reflecting the subjects' performance in the various categories were derived by summing to get totals or, more typically, by converting frequencies to percentages of the total. Percentages were usually obtained by dividing the number (frequency) of message units coded in a given category by the total number of message units in the interaction. Unless otherwise stated, the percentage measures to be described below are based on the total number of message units as the denominator.

Maternal Measures

1. Mother's *Total Words*. Total words from the beginning of interaction until mother called the tester.
2. Mother's *Words per Minute*. After excluding the mother's words occuring during the first and last minute (because these were usually not full minutes), the reduced total number of words by the mother was divided by the number of complete minutes.
3. Percent *Informing*. Total message units coded as informing divided by total units.
4. Percent *Engaging*. Percentage of units.
5. Percent *Gearing*. Percentage of units.
6. Percent *Requesting Physical Feedback*. Percentage of units.
7. Percent *Requesting Verbal Feedback*. Percentage of units.
8. Percent *Controlling*. Percentage of units.
9. *Rate of Affirmation*. This measure coordinates mother and child coding. The number of correct responses by the child which were *immediately* followed by affirmation is divided by the total number of correct responses by the child. When converted to a percentage, this measure reflects the tendency of the mother to react to correct responses by her child with immediate positive feedback or affirmation.
10. *Rate of Negation*. This measure parallels the preceding one except that it involves the mother's reaction to errors by her child. Scores are obtained by totaling the number of errors which were *immediately* followed by negation and dividing by the total number of errors.
11. *Affirmation/Negation Balance Ratio*. This measure is based on the previous two. Scores are obtained by dividing the rate of affirmation by the sum of the rate of affirmation and the rate of negation. When this measure exceeds .50, it signifies that the mother was more likely to respond to a correct response of the child with affirmation than she was to respond to an error with negation.
12. Percent *Physical Messages*. Percentage of total units accompanied by pointing or demonstrating by the mother.
13. *Specificity Index*. This measure reflects the percentage of the mother's messages which contained task-specific labels. The index is obtained by dividing the number of mother messages containing specific labels by the total number of units where specificity was *applicable*. The latter total included all units in which mothers were informing, requesting feedback, or giving feedback to the child.
14. *Global/Specific Ratio*. This index is related to the previous one, but it focuses on one particular type of non-specific message of the mother--the message which contains no specific labels but nevertheless

requires the child to discriminate the attributes of the blocks in order to comprehend fully or to respond appropriately. This is the "global" message, either a feedback request ("Put these blocks on where they belong") or a message intended to convey information ("These blocks belong together") in which the relevant attributes of the blocks are not specified. The index is obtained by dividing the number of global messages by the number of specific messages.

15. Engaging/Controlling Balance Ratio. This index reflects the mother's relative use of the two types of motivating techniques. It is obtained by dividing the number of units coded for engaging by the number of units coded for either engaging or controlling.

Child Measures

Most of the child measures are simple word counts or percentages of units coded in the various categories (using the total number of units as the denominator). The following measures were used in our analysis:

1. Child's Total Words.
2. Child's Words per Minute (excluding the first and last minute, as in the corresponding maternal measure).
3. Percent Passive.
4. Percent Negative Task Involvement.
5. Percent Correct Verbal Responses.
6. Percent Part-Correct Verbal Responses.
7. Percent Incorrect Verbal Responses.
8. Percent Correct Physical Responses.
9. Percent Part-Correct Physical Responses.
10. Percent Incorrect Physical Responses.
11. Percent Questions (task specific).
12. Percent Volunteers Task Information.
13. Percent Positive Task Involvement.
14. Attention Score. This index was obtained by summing the attention ratings and dividing by N, yielding an average attention score.
15. Error Rate. This index gives the relative frequency of errors among the child's responses. It is obtained by dividing the error total by the total responses which were either correct or incorrect. Part-correct responses are excluded.
16. Success Rate. This index refers only to the physical or placement responses of the child and only to occasions where he was trying to place blocks according to both height and mark. It is obtained by dividing the total number of blocks placed correctly on both attributes by the total number of placement attempts.

Supplementary Coding of Selected Variables

The previously described coding concentrates upon the relative frequencies of the various maternal variables and upon the relative success of the children in their task-specific responses. It yields relatively little information about qualitative differences among subjects within categories of behavior. In order to collect data on differences in the completeness and specificity of the mother's task-specific teaching (informing, requesting feedback, giving feedback) and on differences among the children in their behavior during responses (especially maladaptive behavior which interfered with learning), additional coding analysis of the block sorting task was performed. This coding concentrates on those parts of the interaction in which the children were attempting to place blocks into their respective groups (i.e., making "placement responses"). For purposes of analysis, the term "placement response" was reserved for responses of the children which met *all* of the following conditions:

(a) The child was acting *with* the expressed or implied *consent* of the mother (eliminating instances where the child was playing with the blocks or where he began placing them before the mother finished her directions).

(b) The child was to match by *both* height and mark *simultaneously* (eliminating occasions where there were only two groups differing on only one attribute).

(c) The child was to find either the right group for a particular block or the right block for a particular group (either type of matching was considered "placement").

(d) The child made a commitment to a particular block or group of his own (eliminating instances where the mother precluded choice by showing the child where to put a block before he made a commitment). The commitment (and therefore the "placement response") consisted of an indication of a particular block or group as correct; a placement response did not necessarily include the actual placement of a block into a group by the child.

The coding system was devised to measure events occurring before, during, and immediately after "placement responses" as defined above. Placement responses occurred,in natural clusters or units which began when the mother designated a particular set of blocks to be placed in groups, and ended with the placement and discussion of the last of the designated blocks. Ordinarily there were four blocks placed in a unit, since mothers typically removed one block from each group and asked the children to replace them. However, some units contained fewer blocks (if the mother removed fewer or placed some herself), and some contained more (reaching a maximum of twelve if they started with the board empty). Some measures were coded for every block placed, while others were based on events occurring in the unit as a whole. For purposes of description, the variables coded will be grouped on the basis of the units of analysis to which they apply. A summary describing the derivation of measures from the basic coding will follow.

Orientation to the Task

The "orientation period" was defined as including everything that transpired from the beginning of the task until the mother first asked the child to place a block according to height and mark (that is, to make a "placement response" as defined above). The child did not necessarily have to make the response, so long as it was clear that the mother wanted him to place a block; the conclusion of the orientation period was defined as coincident with the end of her first placement request. Six variables relating to the orientation period were coded:

Orientation to the Future

This variable measures the presence or absence of a general statement of what is to come. The mothers were coded for whether or not they gave a general overview of the task facing the child, using the present participle or future tense. The key consideration in coding this variable was the indication that events were to come in the future, regardless of the specific content with which the events were described. Examples:

"We're going to play another game."
"Now I'm going to teach you something else."
"Sit down, I have something new to show you."

Orientation to the Grouping Concept

The orientation period was coded for presence or absence of introduction of the idea that the blocks were organized in groups. Examples:

Present	Absent (borderline)
"These go together because..."	"These are alike because..."
"This one goes with those because they're all..."	"This goes here because it is..."
"The blocks in this group are..."	"These blocks are..."

Orientation to the Sorting Principle Concept

Mothers were coded for presence or absence of introduction of the idea that blocks were sorted for specific reasons. The key consideration involved was whether or not the physical act of block placement was specifically and formally tied to the rationale. Examples:

Present	Absent
"Why does that go there?"	"How are these the same?"
"These go together because..."	"These are all..."

Orientation to the Mark Concept

The mothers' introduction to the "mark" concept was coded on a four-point scale, with each mother receiving credit for the highest level attained at any time during the orientation period. Scale:

0= No Presentation. Mother does not refer to the marks on the blocks before the first placement response.
1= Verbalizing. Mother verbalizes labels ("mark," "X," "O.") but does not contrast or focus on specific examples.

2= Focusing. Mother points to the marks, holds the ends of the blocks up to the child, and/or instructs the child to look at the tops of the blocks when she verbalizes the labels.
3= Contrasting. Mother groups the blocks by mark and/or points back and forth between contrasting marks while verbalizing the labels.

Orientation to the Height Concept

The mothers' introduction of the "height" concept was coded on a parallel four-point scale. Again, the highest level attained during the orientation period was coded. Scale:

0= No Presentation. Mother does not refer to the heights of the blocks before the first placement response.
1= Verbalizing. Mother verbalizes labels ("height," "tall," "short,") but does not contrast or focus on specific examples.
2= Focusing. Mother places her hand across blocks of equal height and/or makes hand motions in the air while verbalizing labels.
3= Contrasting. Mother groups the blocks by height and/or points back and forth between adjacent blocks of contrasting height while verbalizing the different labels.

Length of the Orientation Period

The time spent in orientation before the first placement request provides a rough estimate of the completeness or redundancy of orientation and complements the previous codes which may reflect only a single instance of the relevant variables. To preserve the constancy of meaning across subjects, the orientation period time should include only the time spent in task-relevant activity. Non-task discussion or interruptions devoted to discipline are not counted as part of the orientation time.

Any actions of the mothers up to and including the first placement request may be coded as part of the orientation period. Behavior relevant to the orientation period variables which occurs after the first placement response is not eligible for inclusion in the coding of the above variables.

In coding the specificity of maternal teaching in the orientation period (and also in the coding of instructions and feedback to be described below), material which is elicited from the child is treated as if it had been said by the mother. Thus, if a mother shows the end of a block and asks the child to tell her the mark, and if the child identifies it correctly, the episode is coded as if the mother had pointed to the mark and said, "This is an X."

Pre-Response Instructions

Coding of pre-response instructions is based upon maternal behavior immediately preceding placement responses by the children. This coding taps the degree to which mothers attempt to inject meaning into each individual placement response by giving specific, substantive instructions which cue the child's attention to the relevant attributes of the blocks (height and mark). When a mother verbalizes or elicits the height and/or mark of the block to be placed or the group to be sought, she is coded for specificity in her pre-response instruction, provided that the material precedes the child's commitment to a response. The following information is coded:

Verbalization of Labels

Verbalization of labels is coded if the mother describes the block to be placed ("That's a *tall* block with an *X*") or the group to be sought ("Now where are some other blocks that are *tall* and have an *X* on them?"). Any synonyms for "mark," "*X*," "*O*," "height," "tall," and "short" are acceptable, including idiosyncratic substitutions such as "doughnut" for "*O*." Verbalization of labels is considered absent if the mother remains silent or if she gives directions which lack substantive, specific labels ("Now do *this one*;" "Where does *that block* go?") Presence or absence of labeling of each attribute (height and mark, coded separately) is coded for every block placed.

Focusing

Whenever mothers verbalize or elicit labels before placement they are also coded for presence or absence of focusing attempts (separately for height and mark). "Focusing" in this instance subsumes all behaviors listed previously under either "focusing" or "contrasting" on the scales for coding the presentation of mark and height in the orientation period. Thus, if a mother is coded for presence of focusing during a pre-response instruction, she will have gone beyond mere verbalization of labels by attempting to draw the child's attention to the relevant attributes or by making those attributes more salient in his perceptual field.

Specificity in Global Instructions

The previous two variables apply only to instructions which refer to a specific block which is about to be placed. When complete labels are given, they apply only to the block to be placed and to the target group; they do not apply to other blocks on or off the board. Sometimes, however, mothers give directions which contain specific labels but which are more general in their application. Usually these *global* directions occur at the beginning of a series or unit of placement responses ("Put all the blocks that are the *same height* and have the *same mark* together;" "Put all these blocks on *where they go*"). Any such global directions which occur *before* the first placement response in a series are coded for presence or absence of specific labels (present in the first example above, absent in the second).

Post-Response Feedback

Coding of post-response feedback is based on maternal behavior which comes immediately after (and in reaction to) the placement responses of the children. Corrective feedback after errors, and reaffirmation of the attributes or the sorting principle after correct placements, are both included. Beginning with the moment at which the child first commits himself to a response, everything the mother says and does in relation to the particular block in question is considered in coding post-response feedback. Sometimes a block will be moved several times before being correctly placed, with the mother making statements before and after each placement. All of this activity is considered to be post-response feedback, however, since it is initiated by the child's original error and is triggered by child behavior which precedes it at each step. In some cases several minutes of interaction may be considered as feedback in reaction to a single placement response, although this is a rare occurrence. The coding of the mother's post-response feedback parallels that for pre-response instructions.

Verbalization of Labels

Verbalization of labels in feedback is considered present whenever the mother names or elicits the height or mark of one or more blocks at any time during the feedback following a particular placement (height and mark are coded separately). As in previous coding, the substantive label must be verbalized; statements like "No, those don't look the same" or "That one goes here" do not qualify.

Focusing

Focusing in the coding of post-response feedback has the same meaning and is coded in the same way as in the coding of pre-response instructions (see above).

The coding of maternal teaching described above often involves parallel measures which use the same criteria and ask the same questions. However, with one exception, the various codes refer to mutually exclusive subsections of the interaction. For example, no single word or action can be coded under both pre-response instructions and post-response feedback; it must be one or the other, depending upon its relationship in time to the child's commitment. Similarly, a pre-response statement cannot be both a specific instruction pertaining to a specific block to be placed or group to be sought and a global instruction applying to a series of placements. The only possible overlap involves the mother's global instructions (if any) and specific pre-response instructions (if any) before the first placement. This material is applicable for coding of the orientation period variables as well as the coding of the global instruction for the first unit and the pre-response instruction for the first placement response.

With a single exception, then, any part of the interaction may be classified as orientation, global instructions, pre-response instructions for individual placements, post-response feedback, or as something other than these. The latter activities, mostly either verbal drills in between placement series or interaction unrelated to the task, are not considered in the above coding (they are measured in the previously described coding of message units).

Child Behavior Variables

Child behavior variables are coded on the basis of their presence or absence during units or series of placement responses. A unit is considered to begin when the mother removes a number of blocks (if they are not already off the board) and asks the child to group them by height and mark. Everything that occurs from the time the mothe· first indicates that the child is to place blocks until the last block is placed and discussed is considered part of the unit. The following variables are coded.

Task Resistance

Child behavior coded as task resistance includes overt attempts to leave the table or the room, complaints about having to do the task, refusal to pick up or place the blocks (sulking), protestations that the task is too hard or that the child is too tired, and demands to be taken home. The key aspect of task resistance is the overt expression of displeasure with the task itself. Behavior such as demands for refreshments or interruptive questions about non-task matters are not included under "task resistance," since the element of overtly expressed negative feelings about the task is missing.

Inhibition

Inhibition is coded if the child tries to avoid committing himself to a response by crying or pleading for help or if he makes repeated false starts or hovers over groups without releasing the block and appears to fear committing himself. The latter behavior must be distinguished from sulking or stubborn determination to withhold cooperation, which is coded as task resistance. The key aspect of behavior coded as inhibition is evidence that the child is attempting to avoid committing himself to a response because he appears to be fearful of making a mistake.

Non-meaningful Block Placement

This variable is coded when the child appears to be placing blocks in groups without seriously attempting to determine where they belong and when there is no evidence of any pattern or sorting principle in his placement. Usually it will appear that the child is simply guessing randomly or that he is systematically going from group to group with the knowledge that he will arrive at the correct place eventually. The latter behavior is distinguished from the "false start" or "hovering" forms of inhibition by the speed and apparent lack of concern with which the child places blocks or selects groups. The key aspect of non-meaningful placement is the lack of evidence suggesting that the child is processing the attributes of the blocks and placing them according to a principle based on combinations of height, mark, color, and/or shape. Systematic placement by criteria irrelevant to the task (color or shape) is not considered non-meaningful placement.

Spuriously Successful Block Placement

This variable applies to cases where the children repeatedly sort the blocks correctly but do not give any other indication that they are using the sorting principle of height and mark combinations. It applies only to units in which at least one of each of the four types of blocks is placed and in which all blocks are placed correctly. In such units the placements may be coded as "spurious success" if the coder feels that success did not result from application of the sorting principle but from chance or from memorization according to some idiosyncratic principle. The key element for coding this variable is lack of evidence that the child is attending to and utilizing the attributes of height and mark while placing blocks. One aspect of this behavior is failure to respond when the mother asks for a description of the blocks or for an explanation of [illegible] sorting principle. In addition, a response pattern characterized [illegible] rapid placement without looking or searching behavior that would suggest systematic processing of the blocks is typically present.

General Inattention to the Task

This variable subsumes all non-task behavior of the child except activity coded as task resistance. It is coded when the child fails to listen to the mother completely or to follow her directions promptly because he is involved in non-task interests. Included are interruptive questions about refreshments or play, attempts to play with the blocks or other things in the room, and lapses of attention due to distractions or desires to explore the room. These actions differ from those coded as resistance in that they do not involve an overt expression of displeasure with the task per se (although they may be equally disruptive or undesirable from the mother's standpoint).

The child behavior variables are coded for presence or absence in units, rather than for each separate placement. The unit begins when the mother indicates that blocks are to be placed and ends with the discussion (if any) following the final placement. The unit is coded "2" if the coder feels that a particular variable is clearly or obviously present, "1" if the evidence is less compelling, and "0" if the variable does not appear to be present. The variables are intended to be mutually exclusive, so that a particular behavior sequence should be related to only one variable (if any). However, during the course of a unit the child's behavior may vary, and often it is appropriate to code two or more behavior variables as being present in the same unit.

The child behavior variables may also be coded for presence or absence in the post-task test (except for spuriously successful placement, which does not apply). Resistance, inattention, and inhibition are coded exactly as described above, except that the child is interacting more with the tester than with the mother. Non-meaningful placement is more narrowly defined for the test period. It is coded present for children who say that the test blocks can be placed in any or all of the groups; it is coded absent for children who commit themselves to a specific group, whether they are correct or not and irrespective of the reasons they may offer.

Global Ratings

In addition to the coding of short passages of interaction by the methods previously described, global ratings based on a reading of the entire interaction were obtained on a few variables. To make these ratings, raters read both transcripts (subjects' verbalizations and observer's running descriptions) from the beginning up to the point where the mother called in the tester to test the child. The ratings concern the affective responses of the mothers (praise, criticism, warmth) toward their child and the kind and amount of pressure or control which they exert. For most ratings the raters' job is to determine the scale point which is most typical of the mother's behavior relevant to the variable in question. "Typical" here means "modal" or "usual," as opposed to "average," which implies the use of some subjective averaging technique to arrive at a mean or median score. The choice of this approach reflects our attempt to maximize the comparability of the ratings of mothers by minimizing the effects of differences in the children's cooperation upon them. It is the same approach as that developed by Champney in constructing the Fels Parent Behavior Rating Scales (Baldwin, Kalhorn, and Breese, 1949). The following ratings are made.

Praise

This rating complements the coding of positive feedback and reinforcement by yielding data on the degree to which the mother goes beyond simple feedback to praise the child for his efforts or successes. Simple acknowledgement of correct responses ("Yes;" "That's right") is not considered "praise" unless it is accompanied by dramatic or affectionate components which suggest a more personal response to the child. "Good" and "Fine" are considered praise, as are more intensive and obvious responses such as "My, but you're a smart boy."

Rating Scale for Maternal Praise

> Rate the mother's tendency to praise the child's behavior during the task situation. Does the mother lavish praise upon the child, or does she allow his successes to go unacknowledged? Rate independently of the mother's tendency to criticize the child.
>
> 1. Mother praises the child constantly, rewarding even the most inconsequential successes.
> 2.
> 3. Mother praises frequently, rewarding the child when he concludes significant subsections of the task and also praising his important actions occasionally.
> 4.
> 5. Mother praises the child's more important accomplishments but responds to his minor actions with simple feedback.
> 6.
> 7. Mother praises infrequently, offering only one or two compliments beyond the feedback level.
> 8.
> 9. Mother never praises the child beyond the feedback level throughout the task.

On this and subsequent scales, the undefined scale points (even numbers) are intended to represent midpoints between adjacent defined scale points. The scale points are worded in such a way that the ratings should reflect the mother's tendencies to praise weighted by their opportunities to do so (frequency of success by the child), and not simply the frequency of praise.

Criticism

The criticism rating parallels that for praise by measuring the degree to which mothers go beyond a simple negative feedback ("No;" "That's wrong") to criticize the child personally for his poor cooperation and/or performance. Included are derogations of the child's character or intelligence, expressions of disgust or other negative evaluations of the child, and actual punishment for failure. Negative feedback accompanied by gestural or expressive components which convey negative evaluation of the child is also considered "criticism." Expressions of frustration may or may not be considered "criticism," depending on whether the mother blames the child personally for her disappointment.

Rating Scale for Maternal Criticism

Rate the mother's tendency to criticize the child's actions. Does she punish the child for every error, or does she simply help the child to correct them without criticizing him? Rate independently of the mother's tendency to praise the child.

1. Mother criticizes constantly, punishing even the smallest errors.
2.
3. Mother criticizes frequently, expressing disapproval of the child for poor performance.
4.
5. Mother criticizes the child occasionally for poor performance, but reacts to most errors with simple feedback.
6.
7. Mother criticizes infrequently, expressing disapproval of the child's performance beyond the feedback level only once or twice.
8.
9. Mother never criticizes the child beyond the feedback level throughout the task.

Affectionateness

This rating concerns the mothers' general affective reactions to their children. The scale points are taken from the Affectionateness scale of the Fels Parent Behavior Rating Scales. Because most mothers are typically accepting of their children, raters note high and low extremes of affectionateness which appear during the interaction in addition to rating the mothers' typical behavior.

Rating Scale for Maternal Affectionateness

Rate the mother's expression of affection to the child personally. Does she manifest a warm, personal affection, or a matter-of-fact, unemotional attitude, or definite antagonism?

Location. What is her most typical behavior?

1. Passionate, consuming, intense, ardent, uncontrolled.
2.
3. Affectionate, warm, fondling, loving, expressive.
4.
5. Temperate, fond, attached, forgiving, kind.

the mother has to motivate or control in addition to teaching the material. The rating is based solely on the child's attention and cooperation; successes or failures in task-specific responses are not considered.

Rating Scale for the Child's Cooperation

What was the character of the cooperation shown by the child during the task? Was he interested and attentive, or bored and restless, or resistant? Rate independently of the actions of the mother, considering only the child's behavior.

1. Child was fully tuned in to the mother--pliable, interested, attentive. No difficulty or conflict arose.
2.
3. Child maintained fairly consistent attention and cooperation, although some disinterest or restlessness was evident.
4.
5. Child was periodically inattentive, but inattention was not prolonged, and there was no resistance to the mother or the task.
6.
7. Child showed frequent and prolonged disinterest and inattention, and/or resistance to the mother or the task.
8.
9. Child ignored the mother's teaching efforts and/or actively resisted the task throughout the interaction.

The previous five rating scales are used for both the block sorting task and the Etch-a-Sketch task protocols. Two independent sets of ratings are obtained and all differences are resolved to arrive at final scores. When the difference is a single point, the even-numbered score is assigned by convention. When the difference is two points, the score in between the two ratings is assigned. Differences of three or more points are resolved by re-rating and discussion.

The following three scales are used only with the block sorting task. They measure the pressure or control exerted by the mothers in handling three common difficulties presented by the children.

Demand for Attention

This rating categorizes the mother's response to inattentiveness in the child. The categories reflect the success or failure of the mother to obtain attention, rather than the methods she uses in attempting to do so.

Rating Scale for Demand for Attention

What quality of attention does the mother demand?

1. Mother is constantly alert to the child's behavior and her attitude is one of "all business." She demands complete attention.
2. Mother is not constantly alert to the child's behavior, but she does intervene to focus his attention on the task (or her talking) when she becomes aware of lack of attention.
3. Mother may be constantly aware of the child's state, but she accepts his restlessness, looking aroung, etc. However,

she will intervene if the child begins to tune out more obviously.

4. Mother is aware of the child's attention or lack of it but is unable to do anything about it, although she tries.
5. Mother is aware of the child's attention or lack of it, but she does nothing to focus his attention. She is either undisturbed by the child's disinterest or is confused and unable to deal with it except by repetition of her lecture.
6. Mother abandons the task rather than demand attention.

Response Quality Demand

This rating categorizes the mother's response to a child who makes responses which appear to be random guesses or which appear to be emitted without evidence of forethought or ego-involvement. The categories reflect differences in the degree to which mothers are vigilant in recognizing this behavior and attempting to correct it. Cases in which the problem never arises are rated as "not applicable," since the mothers' responses cannot be determined.

Rating Scale for Quality of Response Demanded

What does the mother demand of the child when he is attempting to place blocks or to verbalize labels? Does he have to be fully ego-involved in each response, or can he simply "emit" responses?

0. Not applicable. Child always spontaneously inspected blocks before acting and never needed to be told to think about what he was doing.
1. Mother consistently demanded that the child look at the blocks carefully before responding, so that each response would be a deliberate, purposive act.
2. Mother did not consistently demand that the child inspect blocks before responding, so that at times the child might have been working from memory or hunch (rather than making deliberate choices based on perception of the relevant properties of the blocks).
3. Mother allowed obvious guesswork from the child, who simply "emitted" responses.
4. Mother allowed responses which showed that the child was not meaningfully involved in the task (placing blocks in the nearest group, persisting in an irrelevant verbal response, parroting the mother's last words, etc.).

Response to Tuning Out

This rating categorizes the reactions of mothers when the children force an interruption of task-oriented teaching by becoming absorbed in non-task interests. This behavior is called tuning out, and is to be distinguished from both inattention (a more general term which includes scanning of the surroundings and other forms of inattention to the mother which do not involve complete absorption in a specific, localized non-task interest) and resistance (negative response to the task itself rather than positive interest in something else). The categories reflect different degrees of maternal tolerance of tuning-out by the children.

Rating Scale for Maternal Response to Tuning Out

How does the mother react if the child asks a non-task question (about going home, playing, food, etc.)? Tuning out differs from simple inattention in that the child becomes absorbed and fully ego-involved in the non-task interest. It differs from resistance in that the child is not openly defying the mother.

0. Not applicable. Child never tunes out.
1. Mother adopts a "Never mind that--you're supposed to pay attention" attitude. She does not discuss or deal with the child's new interest at all and tries to focus him back on the task immediately.
2. Mother gives a minimal response and then continues the task. She doesn't seem irritated with the child, but she is obviously unwilling to interrupt the task. She satisfies the child only enough to avoid direct conflict.
3. Mother makes some attempt to satisfy the child's curiosity and/or to wait until his new interest dissipates, but she is eager to return to the task at the opportune moment. She seems to want to gratify the child but also to fear the consequences of interruption.
4. Mother seemingly does not mind the intrusion and is not threatened by it. She is not overly eager to return to the task immediately, and she allows the child to dwell on the intrusion until he loses interest in it.
5. Mother ignores or seems oblivious to the child's tuning out and continues with the task as though the interference never occurred.
6. Mother succumbs to the non-task interest, losing control of the child.

Maternal Support in the Test Period

This rating categorizes the mothers' reactions to their children during the post-task test period. Although the mothers are not allowed to give information or prompts, they can and do attempt to support the children through exhortation or expressions of confidence. In addition, they often influence the children unwittingly by making obvious expressive or gestural reactions.

Rating Scale for Maternal Support in the Test Period

1. Rejection. Mother blames the child for failure or makes derogatory remarks about him to the tester.
2. Dissatisfaction. Mother scowls, frowns, exhorts impatiently, or otherwise indicates dissatisfaction with the child's performance, but she does not overtly blame or accuse him.
3. Neutral. Mother withdraws from involvement during testing. She watches the interaction between child and tester but keeps her reactions to herself.
4. Implicit Support. Mother communicates sympathy, confidence, and/or support through minimal expressive cues or cheerful encouragement.

5. Explicit Support. Mother makes a point of praising the child's success or of defending him and reaffirming positive regard after failure.

For these four ratings, and for all the coding previously described, scores are assigned after resolving all disagreements by returning to the data. Thus, each separate code or rating either was agreed upon in the original codings or is the score agreed upon after discussion (except for those ratings on five scales which were determined by convention).

Measures Derived from the Supplementary Coding

A second set of measures on the mothers and children was derived from the coding analysis and rating scales just described.

Maternal Measures

1. Orientation to the Future. Present or absent.
2. Orientation to the Grouping Concept. Present or absent.
3. Orientation to the Sorting Principle Concept. Present or absent.
4. Orientation to the "Mark" Concept. Score on four-point scale (0-3).
5. Orientation to the "Height" Concept. Score on four-point scale (0-3).
6. Length of Orientation Period. 0= less than 30 seconds, 1= 31-90 seconds, 2= 91-150 seconds, 3= more than 150 seconds.
7. Percent Both Labels (Pre-Response). Percentage of blocks placed which were preceded by a maternal instruction which gave both relevant labels.
8. Percent Any Label (Pre-Response). Percentage of blocks placed which were preceded by a maternal instruction which gave either (or both) of the relevant labels.
9. Percent Pre-Response Focusing. Percentage of blocks placed which were preceded by maternal attempts to focus the child's attention on the relevant attributes (either or both); i.e., the percentage of placement responses on which the mother was coded for "focusing" during her pre-response instructions.
10. Percent of Global Instructions Containing Labels. Percentage of placement units which were preceded by global instructions which contained specific labels.
11. Percent of Labels after Error. Percentage of errors followed by feedback containing verbalization of the appropriate label(s). For this and the following measure, failures to match either by height or by mark are counted as errors. Thus, for a particular block placement there may be no errors, one error (correct on one attribute), or two errors (wrong on both attributes). In coding both errors and verbalization of labels after errors, only presence or absence was noted. "Presence" was coded if the error or the label occurred at

any time between the first commitment to a group and the final discussion following that or any succeeding placements of the block (all of which are considered part of the same placement response). Thus, redundancy due to repetition of the same error and/or feedback message which occurs during a single placement response is not taken into account. For each block, then, presence or absence of mark errors, height errors, verbalization of mark labels, and verbalization of height labels is recorded. The measure used is the percentage of errors which were followed by feedback containing verbalization of a label describing the attribute on which the error was made. If a more molecular level of analysis is desired, both errors and feedback could be tabulated for each successive movement of a block following the original commitment. This was not done in our analysis because it appeared that most mothers treated these events as progressive subparts of a larger whole, and their feedback messages often referred back to events earlier in the sequence; so it was felt that a more molecular definition of response and feedback was likely to reduce validity.

12. Percent Focusing after Error. Percentage of errors on which the mothers' feedback was coded for focusing on the appropriate attribute in addition to verbalizing a label. This measure parallels the previous one, and the discussion above also applies here.

13. Percent Labels after Success. Percentage of blocks placed correctly (by both attributes) which were followed by verbalization of one or more labels.

14. Percent Focusing after Success. Percentage of blocks placed correctly (by both attributes) which were followed by attempts to focus attention on either or both attributes.

15. Praise. Rating on nine-point scale.

16. Criticism. Rating on nine-point scale.

17. Modal Affectionateness. Rating on thirteen-point scale.

18. High Point Affectionateness. Rating on thirteen-point scale.

19. Low Point Affectionateness. Rating on thirteen-point scale. "High" and "low" refer to the mother's affectionateness rather than to the number of the cue points on the scales, so that the high point corresponds to the lowest-numbered end of the range for each mother.

20. Acceptance-Rejection. Rating on nine-point scale.

21. Demand for Attention. Rating on six-point scale.

22. Response Quality Demand. Rating on four-point scale.

23. Response to Tuning Out. Rating on four-point scale.

24. Test Period Support of Child. Rating on five-point scale.

Child Measures

1. Resistance. Percentage of units coded for resistance by the child (36% of our cases had one or more units coded for resistance)

2. Inhibition. Presence or absence in one or more units (percentage scores were not used because only 15% of the children were coded for inhibition at any time).
3. Non-meaningful Placement. Average score obtained by summing the codes for each unit (0, 1, or 2) and dividing by the number of units (present in 42% of the cases).
4. Spuriously Successful Placement. Presence or absence (present in 21% of the cases).
5. Inattention. Average score obtained by summing the codes for each unit (0, 1, or 2) and dividing by the total number of units (present in 72% of the cases).
6. Resistance in the Test Period. Presence or absence (present in 4% of the cases).
7. Inhibition in the Test Period. Presence or absence (present in 10% of the cases).
8. Non-meaningful Placement in the Test Period. Presence or absence (present in 21% of the cases).
9. Inattention in the Test Period. Presence or absence (present in 18% of the cases).

Other child measures may be obtained by combining some of the above scores to form groups of high vs. low in undesirable behavior variables, presence vs. absence of test period behaviors, etc.

Factor Analyses of the Measures

The measures described in this manual allow an exhaustive, detailed analysis of the block sorting task interactions. However, for many purposes this proliferation of scores is less useful than a smaller number of more basic and inclusive variables. Consequently the data from the Cognitive Environment Study were subjected to factor analyses (principal component, separate analyses for mother measures and child measures). Although results varied somewhat as new rotations were performed, six mother factors and four child factors which made good theoretical as well as statistical sense appeared regularly. These factors subsume twenty-eight mother measures and eighteen child measures, so that considerable data reduction is achieved.

Although the composition of factors was determined by examination of rotated factors, the factor scores used in the Cognitive Environment Study are based on unrotated factors. In this way the data are reduced to basic measures reflecting the major variables involved, but orthogonality is not forced as it is in rotated factors. Factor composition was determined from the factor loadings, with .40 being designated as the minimal loading allowed for inclusion of a variable on a factor. By this method, twenty-eight maternal variables were grouped on six factors, and eighteen child variables were grouped on four factors, with each variable appearing on only one factor. Factor scores were obtained by entering into a new analysis only the variables to be included on the factor (rather than the entire set of mother or child variables) and then obtaining the first unrotated factor. The subjects' factor scores from these unrotated first factors were then used as basic measures, along with other measures that did not appear on any factor. Presented below is a list of the variables on factors with their raw correlations, their correlations with the factors, and their loadings on the original rotated factors from which factor composition was determined.

Factor 1: Praise and Engagement

This factor includes seven maternal measures which involve either attempts to engage the child's interest in the task through stressing its potential as a satisfying, enjoyable experience, or positive, rewarding responses to the child's performance.

Variable	11	2	3	4	5	6	7	r with factor	loading on rotated factor
1. Praise Rating (Block Sorting Task)	--	.48	.33	.36	.22	.19	.44	.72	.69
2. Praise Rating (Etch-a-Sketch)		--	.26	.24	.29	.21	.36	.66	.58
3. Percent Engaging			--	.14	.20	.15	.68	.67	.69
4. Rate of Positive Reinforcement				--	.15	.21	.18	.47	.52
5. Orientation to the Future					--	.18	.31	.49	.40
6. Support in the Test Period						--	.32	.47	.42
7. Engaging/Controlling Balance Ratio							--	.79	.74

All coefficients on the preceding table, as well as on those below, are adjusted so that the signs reflect the actual direction of the relationship between variables, uninfluenced by the numerical codes assigned to different scale points or behaviors. Negative r's have been eliminated except where the relationship is actually negative.

Factor 2: Coercive Control

This factor subsumes two measures of maternal attempts to motivate through punishment, or demands which imply punishment as a penalty for non-compliance.

Variable	1	2	r with factor	loading on rotated factor
1. Criticism (Block Sorting Task)	--	.38	.83	.50
2. Controlling Percent		--	.83	.75

Factor 3: Orientation

This factor includes measures of orientation before the first placement and the index of specificity in global instructions (which is a form of orientation preceding each new unit or series of placements).

Variable	1	2	3	4	5	6	r with factor	loading on rotated factor
1. Orientation to the "Group" idea	--	.49	.23	.36	.45	.23	.68	.72
2. Orientation to the Sorting Principle		--	.31	.33	.48	.15	.70	.70
3. Orientation to the "Mark" Concept			--	.42	.44	.10	.61	.41
4. Orientation to the "Height" Concept				--	.61	.23	.75	.63
5. Length of Orientation Period					--	.30	.83	.73
6. Index of Labeling in Global Instructions						--	.42	.49

Factor 4: Specific Instructions

This factor subsumes the three pre-response instruction measures from the block sorting task and three measures from the Etch-a-Sketch task. The factor is considered to be theoretically as well as statistically valid, since the Etch-a-Sketch measures closely resemble the pre-response measures on the block sorting task in the types of maternal behavior they represent.

Variable	1	2	3	4	5	6	r with factor	loading on rotated factor
1. Etch-a-Sketch Practice Rating	--	.20	.49	.17	.16	.07	.46	.47
2. Etch-a-Sketch Use of Models		--	.30	.20	.22	.20	.49	.42
3. Etch-a-Sketch Specificity of Directions			--	.19	.19	.17	.54	.53
4. Percent Both Labels, Pre-Response				--	.89	.22	.80	.63
5. Percent Any Label, Pre-Response					--	.48	.87	.72
6. Percent Focusing, Pre-Response						--	.55	.58

Factor 5: Specific Feedback

This factor includes the four measures of post-response feedback.

Variable	1	2	3	4	r with factor	loading on rotated factor
1. Percent Labels after Error	--	.51	.38	.31	.74	.49
2. Percent Focusing after Error		--	.17	.36	.67	.79
3. Percent Labels after Success			--	.60	.74	.46
4. Percent Focusing after Success				--	.78	.67

Factor 6: General Verbal Specificity

This factor includes three measures of the mothers' degrees (percent used when applicable) of saturation of task-specific labels (references to height and mark). The measures span the task as a whole rather than a selected subpart (such as feedback).

Variable	1	2	3	*r* with factor	loading on rotated factor
1. Percent Informing	--	-.20	.42	.62	.65
2. Global/Specific Ratio		--	-.62	-.80	-.66
3. Specificity Index			--	.89	.69

The previous six factors all involve measures of maternal teaching. The following four factors are comprised of measures of the children's behavior during the interaction.

Factor 7: Resistance

This factor includes measures of inattention and resistance to the task. Resistance is considered the key to the factor because of the variables included on the factor and because the rating of inattention due to interest in non-task matters (which does not imply resistance) did not appear on the factor.

Variable	1	2	3	4	5	*r* with factor	loading on rotated factor
1. Cooperation Rating, Block Sorting Task	--	.44	-.56	.57	-.57	-.82	-.73
2. Cooperation Rating, Etch-a-Sketch		--	-.24	.26	-.38	-.55	-.47
3. Percent Negative Task Involvement			--	-.69	.51	.80	.75
4. Attention Score				--	-.57	-.82	-.80
5. Resistance Score					--	.80	.85

Factor 8: Errors

This factor represents low vs. high frequency of errors in block placement, with the "high" subjects usually being coded for non-meaningful placement.

Variable	1	2	3	4	*r* with factor	loading on rotated factor
1. Percent Incorrect Placements	--	.52	.37	-.39	.73	.65
2. Error Rate		--	.44	-.44	.75	.58
3. Non-meaningful Placement Score			--	-.58	.76	.73
4. Success Rate				--	.78	-.76

Factor 9: Labels

This factor includes two direct measures of the child's success in giving the correct labels for the blocks on request, and two other measures which are associated with failure to verbalize labels.

Variable	1	2	3	4	*r* with factor	loading on rotated factor
1. Percent Correct Verbal Responses	--	.32	-.21	-.26	.72	.54
2. Percent Part-Correct Verbal Responses		--	-.24	-.26	.73	.57
3. Percent Questions by Child			--	.06	-.52	-.59
4. Spuriously Successful Placement (Presence)				--	-.59	-.64

Factor 10: Verbal Participation

This factor subsumes variables which relate to the degree to which the child was verbally active. Only the verbal vs. non-verbal distinction is implied; children high on the factor are not necessarily high in knowledge or use of task-specific information.

Variable	1	2	3	4	5	r with factor	loading on rotated factor
1. Percent Units Child is Passive	--	.21	-.12	-.34	-.33	-.57	-.55
2. Percent Correct Placements		--	-.28	-.28	-.38	-.63	-.57
3. Percent Volunteers Task Information			--	.22	.41	.58	.58
4. Child's Total Words				--	.50	.72	.70
5. Child's Words per Minute					--	.81	.74

It should be re-emphasized that the signs of the coefficients on the above-listed factors are adjusted to reflect the true direction of the relationships among the variables as labeled (not necessarily the direction obtained from correlating the numerical ratings and scores). Examination of the data with this in mind reveals that none of the intercorrelations among variables is particularly unusual or surprising insofar as the direction of relationship is concerned; all conform to what would have been predicted on the basis of prior knowledge of the variables involved.

Since unrotated rather than rotated factors were used, correlation between factors within the two sets (mother and child measures) can and does exist. Intercorrelations among all 10 factors are presented in the table that follows.

Most of the intercorrelations among factors within sets (mother or child) are in the .20 to .30 range, with none above .33. This seems quite satisfactory, if not optimal, for our purposes, since the effects of gross differences among mothers are not lost through forced orthogonality, but at the same time the specific character of each factor is maintained.

Listed below the ten factors described earlier are three additional factors from other analyses. They are included on the table to facilitate interpretation of their content. The "affectionateness" factor is the first unrotated factor subsuming eight ratings of maternal behavior (the three affectionateness ratings and the acceptance-rejection rating, from the block sorting task and the Etch-a-Sketch task). Although based on different measures, this factor overlaps considerably with the two maternal factors relating to motivation techniques. The affectionateness factor is considered to be more general than the latter two factors, which for the most part are restricted to verbal behavior and to task-specific interaction sequences.

Table of Intercorrelations among Factors

Factor	Subject	Description	1	2	3	4	5	6	7	8	9	10
1	Mother	Praise and Engagement	--	-.20	.25	.33	.23	.04	-.05	-.18	.12	.10
2	Mother	Coercive Control		--	-.09	-.06	-.18	-.10	.40	.30	-.21	-.04
3	Mother	Orientation			--	.26	.31	.19	-.10	-.23	.31	.10
4	Mother	Specific Instructions				--	.27	.32	-.06	-.14	.30	.09
5	Mother	Specific Feedback					--	.28	-.20	-.28	.41	.09
6	Mother	General Verbal Specificity						--	00	-.30	.19	.11
7	Child	Resistance							--	.21	-.27	.08
8	Child	Errors								--	-.22	-.09
9	Child	Labels									--	.14
10	Child	Verbal Participation										--
		Affectionateness Factor	.60	-.45	.21	.17	.15	.03	-.15	-.15	.13	.15
		"Tug-of-War" Factor	-.26	.51	-.17	-.19	-.24	-.01	.80	.25	-.36	.02
		"Task-Specific Verbal Interaction" Factor	.22	-.12	.21	.08	.31	.12	-.07	-.42	.37	.69

The "tug-of-war" and "task-specific interaction" factors are from an earlier analysis which included only the variables from Dr. Jackson's message unit analysis. These factors were obtained from a matrix containing both mother and child measures and were extracted through an image-covariance method rather than a principal component analysis. The "tug-of-war" factor represents high vs. low resistance by the child and maternal attempts to control through negative sanctions. Interactions high on the factor were marked with conflict between mother and child. The "task-specific verbal interaction" factor is more general. It overlaps considerably with the child's verbal participation factor (factor 10 above), but it also includes task-specific child performance measures and maternal teaching measures. Interactions high on this factor are characterized by relatively good maternal teaching, high verbal participation by the child, and relatively successful learning by the child.

APPENDIX K

Means and Standard Deviations for Interaction Variables by Social Status and Sex

	Middle Class		Working Class						Boys		Girls	
			Skilled		Unskilled							
					Father Present		Father Absent					
	(N=40)		(N=41)		(N=40)		(N=41)		(N=80)		(N=82)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Orientation Factor	18.88	1.64	20.28	1.92	20.35	1.99	20.47	1.92	19.90	1.79	20.10	2.13
Requesting Block Placement	8.17	4.71	13.91	8.78	13.16	6.89	14.06	5.37	12.70	6.94	12.00	7.10
Requesting Labels	21.05	8.86	20.45	9.19	20.89	10.14	19.65	9.42	21.20	9.43	19.83	9.26
Specific Instructions Factor	18.53	1.57	20.36	1.31	20.59	1.12	20.50	1.10	19.92	1.47	20.08	1.59
Specific Feedback Factor	19.30	1.97	19.89	2.24	20.25	1.71	20.54	1.50	19.82	2.01	20.17	1.81
General Verbal Specificity	48.20	16.20	42.56	14.78	44.72	16.07	39.17	12.45	43.75	14.21	43.51	16.12

	Middle Class		Working Class						Boys		Girls	
			Skilled		Unskilled							
					Father Present		Father Absent					
	(N=40)		(N=41)		(N=40)		(N=41)		(N=80)		(N=82)	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Affirmation/ Negation	57.27	17.54	47.08	21.31	44.08	21.58	45.46	22.39	46.62	19.94	50.15	22.56
Praise and Engagement	18.67	1.52	20.42	1.18	20.21	1.56	20.63	1.48	19.94	1.79	20.04	1.45
Coercive Control Factor	20.13	0.53	19.92	0.62	20.02	0.64	19.94	0.60	20.00	0.60	20.00	0.60
Attention Demand	2.18	1.15	2.12	1.14	1.95	1.15	2.07	1.33	2.01	1.10	2.15	1.28
Response Quality Demand	2.03	1.05	1.87	0.79	1.69	0.86	1.90	0.90	1.81	0.90	1.92	0.90
Affectionateness Factor	21.75	3.14	19.33	3.72	19.85	3.89	19.15	3.74	19.59	4.16	20.43	3.27
Resistance Factor	19.65	2.88	19.87	2.51	20.54	2.43	19.95	2.43	20.00	2.24	20.00	2.86
Errors Factor	20.46	1.30	19.98	1.71	20.08	1.75	19.49	1.92	20.02	1.61	19.98	1.81
Labels Factor	20.18	0.42	20.04	0.50	19.93	0.38	19.86	0.45	20.00	0.49	20.00	0.42

Verbal Participation Factor	19.68	0.94	20.04	1.07	20.03	1.23	20.25	0.83	19.98	1.04	20.02	1.04
Non-meaningful Placement Score	1.28	2.97	3.46	5.32	4.70	6.69	5.10	6.81	3.25	5.20	4.02	6.36
Interruptive Distraction Score	7.40	7.20	5.68	5.46	4.18	5.12	6.71	6.75	5.90	6.00	6.09	6.53
Tug-of-War Factor*	-1.93	13.61	0.64	9.64	-0.95	12.09	1.73	8.93	-0.69	8.89	0.37	13.18
Verbal Task Interaction Factor*	5.60	8.48	-0.17	12.46	-2.16	12.80	-3.97	9.37	-0.00	11.75	-0.18	11.21
Toy Sorting Task Score	2.63	2.02	2.15	1.68	2.13	1.90	1.93	1.42	2.05	1.71	2.35	1.83
Block Sorting Task Score	3.25	1.84	2.10	1.61	1.75	1.74	1.39	1.16	2.16	1.60	2.07	1.86
Etch-a-Sketch Score	15.58	9.39	11.19	7.79	9.60	8.33	11.76	8.45	11.31	8.09	12.72	9.26

*These are rotated factors extracted through an image covariance method; all other factors are unrotated first factors from principal component analysis.

APPENDIX

Chi-square Tests for Social Status and Sex Differences

Child Behavior	Middle Class vs. Working Class:					
	Skilled		Unskilled			
			Father Present		Father Absent	
	Direction	X^2	Direction	X^2	Direction	X^2
Inhibition in Responding	M < UL	(n.s.)	M < LL	(n.s.)	M < A	(n.s.)
Spuriously Successful Placement	M < UL	4.29**	M < LL	3.53*	M < A	6.36**
Test Period Inhibition	M < UL	(3.16)*	M < LL	(3.24)*	M < A	(n.s.)
Test Period Non-meaningful Placement	M > UL	(n.s.)	M < LL	3.12*	M < A	9.17***
Test Period Combination Score[2]	M < UL	2.93*	M < LL	9.60***	M < A	14.60****
Teaching Period Combination Score[3]	M < UL	7.83***	M < LL	9.82***	M < A	13.44****

[1] Chi-square values enclosed in parentheses are corrected chi-squares all others are uncorrected.

[2] Presence of Inhibition or Non-meaningful Placement.

[3] Cutting score separating High vs. Low on child behavior variables.

*$p < .10$; **$p < .05$; ***$p < .01$; ****$p < .001$

L

in Presence vs. Absence of Child Behavior Variables[1]

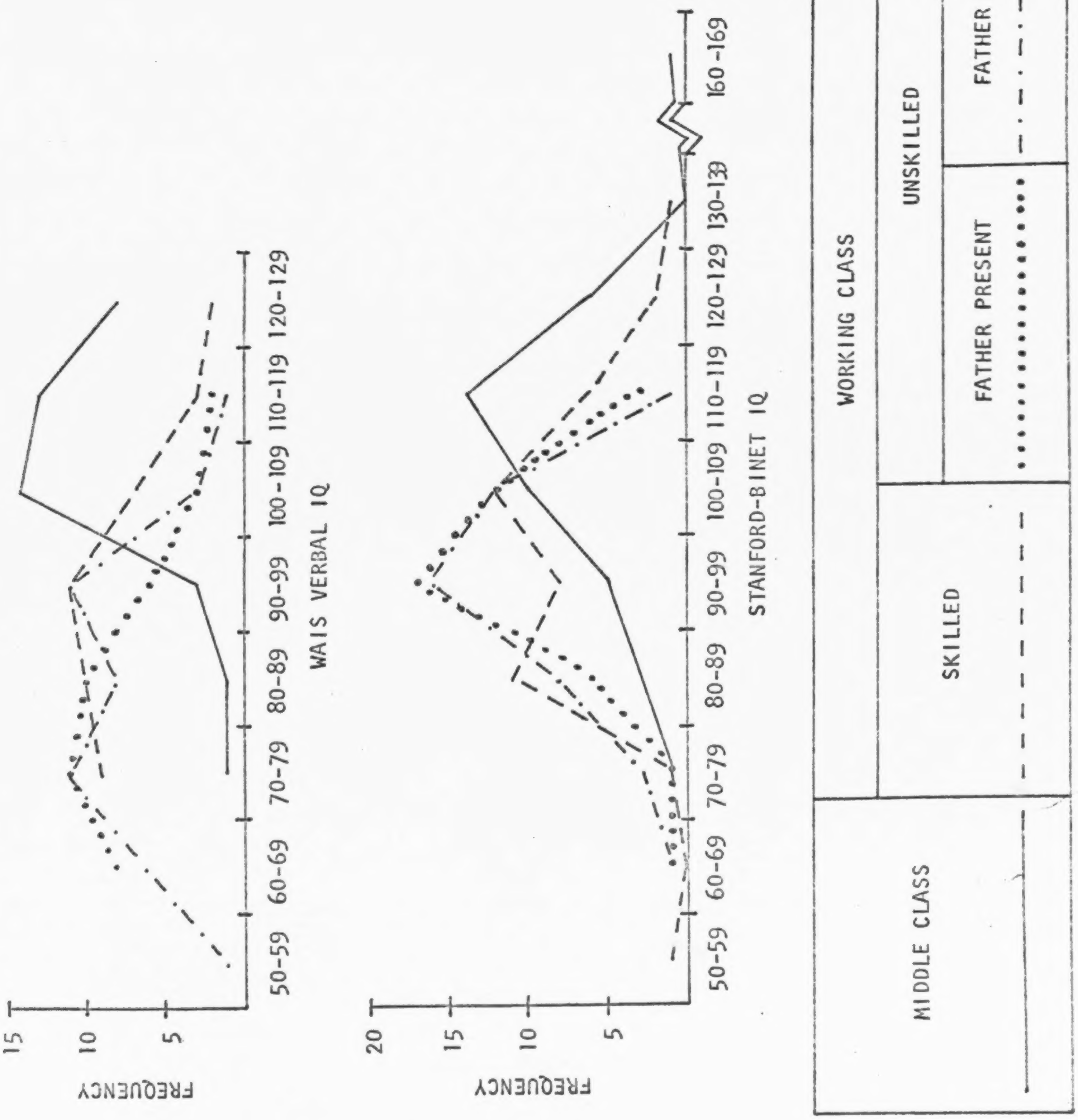
Working Class:						All Groups Combined:	
Skilled vs. Unskilled:				Unskilled:			
Father Present		Father Absent		Father Present vs. Father Absent		Boys vs. Girls	
Direction	X^2	Direction	X^2	Direction	X^2	Direction	X^2
UL < LL	(n.s.)	UL = A	(n.s.)	LL > A	(n.s.)	B > G	n.s.
UL > LL	n.s.	UL < A	n.s.	LL < A	n.s.	B < G	n.s.
UL < LL	(n.s.)	UL > A	(n.s.)	LL > A	(n.s.)	B < G	n.s.
UL < LL	3.29*	UL < A	9.52***	LL < A	n.s.	B > G	n.s.
UL < LL	n.s.	UL < A	5.26**	LL < A	n.s.	B < G	n.s.
UL < LL	n.s.	UL < A	n.s.	LL < A	n.s.	B < G	n.s.

---

used when the expected frequency of one or more cells was below five;

APPENDIX M

FREQUENCY DISTRIBUTIONS OF WAIS VERBAL IQS AND STANFORD-BINET IQS



APPENDIX N

ADMINISTERING AND SCORING THE CURIOSITY TASK

The four-year-old children in the Cognitive Environment Study sample were administered an experimental measure of curiosity motivation at the second testing session. The stimuli were eight pairs of simple and complex drawings, adapted from those used by Berlyne (1954, 1957, 1960) and Smock and Holt (1962). The viewing apparatus or "curiosity picture-box" was similar to that used in the Cantors' studies (Cantor & Cantor, 1964; Cantor, Cantor, & Ditrichs, 1963).

Procedure

Sixteen test pictures, preceded by two trial cards, were presented to the child one at a time in a large viewing box: each card was inserted inside the box at the rear, and the child was told to look through a viewing slot at the front of the box. The pressure of the child's head on a bar immediately above the viewing slot operated a light so that the interior of the box was illuminated and the picture could be seen only when the child was leaning his forehead against the bar, looking into the viewing slot. The same mechanism activated a clock. When the child sat back in his chair, moving his head away from the viewing slot, the light went off and the clock stopped. Viewing time was registered on the clock to .01 seconds.

Stimuli

Each of the eight pairs of drawings of common geometric figures, elements, and animals, is composed of a simple and a complex member, defined by the number of objectively observable elements or relationships represented. Each pair is characterized by one of four types of stimulus complexity: Complexity, Incongruity, Point Dispersion, Element Dispersion. The order of presentation of the 16 cards was counterbalanced for both presence and type of complexity.

Administration

The subject was seated in a child-sized chair, facing the picture-box which was placed on a low table. The examiner sat to the child's right and perpendicular to the child's line of vision.

The instructions given to the child by the examiner were aimed at accomplishing, in steps, the following:

1. the child understands how to make the light go on;
2. the child understands how to make the light go off and how to keep it on for some time;
3. the child explores the empty box to satiate any motivation toward that object;

4. the child demonstrates, in two trial items, his ability to turn on the light, focus his attention on the drawing inside the box, and turn the light off when he no longer wants to see that item.

Scoring

Two types of scores were obtained from the recorded total viewing time for each picture: total viewing scores, and proportion scores indicating relative preference for complex or simple items.

Total Viewing Time

The Total Viewing Time is the total number of seconds (to .01 seconds) for all sixteen cards; subscores for Total Viewing Time include the Total Complex Time or total number of seconds viewing the eight complex items, and Total Simple Time or the total time viewing the eight simple items.

Curiosity Proportion

Curiosity Proportion scores included, for each pair, the ratio of time viewing the complex member to the total time spent on both members of the pair (Complex / Complex + Simple); for each type of stimulus complexity, a mean proportion score was obtained by summing the proportion scores for the two pairs representing that type of complexity, and dividing by two (e.g., pair 2 proportion + pair 6 proportion, divided by 2, gives the average proportion score for Incongruity). Finally, an overall curiosity ratio score was obtained by dividing the Total Complex Time by Total Viewing Time. This score is again Complex / Complex + Simple, a summary statement across all 8 pairs without, however, giving equal weight to each pair: it is not the average of the 8 proportion scores.

APPENDIX O

ANALYSIS OF MATERNAL LANGUAGE STYLES*

Maternal Speech Samples

Several items administered to the mother during the home interview and in test sessions at the University were selected for analysis of language styles employed by the mother: Typical Day, Mother-Teacher, and the Children's Apperception Test Card No. 3. Tape recordings of mothers' responses to each item were transcribed verbatim, and the typed protocols were used for language analysis.

Typical Day

During the home interview the mother was asked to describe a typical day in her home:

> NOW MRS. _____, I WOULD LIKE FOR YOU TO TELL ME IN AS MUCH DETAIL AS POSSIBLE ABOUT YOUR ACTIVITIES AND THOSE OF YOUR FAMILY YESTERDAY. WE HAVE FOUND THAT WE CAN LEARN A GREAT DEAL ABOUT WHAT OUR FOUR-YEAR-OLDS ARE LIKE AND WHAT THEY LIKE TO DO IF WE FOLLOW THEM CLOSELY FOR ONE WHOLE DAY. WE KNOW THAT EVERY CHILD AND EVERY HOUSEHOLD IS DIFFERENT. WE HOPE THAT YOU WILL FEEL FREE TO TELL US IN YOUR OWN WAY ABOUT YOUR ACTIVITIES AND THOSE OF THE FAMILY AS YOU LIVED TOGETHER YESTERDAY.
>
> I KNOW THAT IT IS OFTEN DIFFICULT TO RECALL EVERYTHING WE DO. I WILL ATTEMPT TO HELP BY ASKING QUESTIONS AT INTERVALS, OR FROM TIME TO TIME IF IT BECOMES A LITTLE DIFFICULT. WE WANT TO GET A COMPLETE PICTURE OF THE WHOLE DAY--FROM THE TIME YOU AND (four-year-old child) GET UP UNTIL BEDTIME. YOU MAY HAVE QUESTIONS: I WILL BE GLAD TO ANSWER ANY THAT I CAN.

Suitable probing questions were used by the interviewer to obtain a full account of the day's activities, to fill in gaps left in the mother's narrative, and to inquire about areas she might overlook.

Mother-Teacher Picture

During the home interview, the mother was shown a photograph of two Negro women seated on opposite sides of a large desk in a classroom. (Negro models were used for the picture, since the Cognitive Environment Study sample was composed of Negro subjects.)

The interviewer instructed the mother:

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*The major portion of this guide to language analysis was prepared by Dr. Ellis G. Olim, Department of Human Development, University of Massachusetts, Amherst.

> HERE IS A PICTURE OF A TEACHER AND A MOTHER TOGETHER IN A CLASSROOM. CAN YOU TELL A STORY ABOUT WHY THE MOTHER CAME TO SCHOOL AND WHAT THEY ARE TALKING ABOUT HERE IN THE PICTURE?

The photograph was used as a standard projective device to elicit a story with a beginning, a middle, and an end. If necessary, the interviewer asked, WHAT WILL HAPPEN AS A RESULT OF THEIR CONVERSATION?

CAT Card No. 3 (Lion-Mouse)

At the final testing session, with the child present, the interviewer showed the mother Card 3 from the Children's Apperception Test and told her:

> HERE'S A PICTURE. I'D LIKE YOU TO TELL A STORY TO (four-year-old child) JUST AS IF YOU WERE HOME. MAKE UP A STORY ABOUT WHAT YOU THINK IS GOING ON IN THIS PICTURE--WHAT THE EVENTS ARE THAT LED UP TO IT--HOW THEY'RE FEELING--AND HOW YOU THINK IT'S GOING TO END.

Appropriate probes were used, in standard projective fashion, to obtain a story with a beginning, middle, and end.

Analysis of Language Samples[1]

Each of the three language samples was analyzed and scored for mean sentence length and mean pre-verb length. Scores were obtained for each sample on a series of scales measuring the use of uncommon adjectives and adverbs, of different types of verb forms, of abstract nouns and verbs, and of complete syntactic structures. The two language samples obtained with projective instruments--Mother-Teacher Picture and CAT Card 3--were also scored for introduced content and stimulus utilization.

Descriptions of the measures and the procedures used in analyzing and scoring the language samples for maternal language styles are detailed in the remaining sections of this manual.

Mean Sentence Length

Scale Description

The mean sentence length is obtained by dividing the total number of words in the protocol by the number of sentences.

Definition of Sentence

Traditional grammar definitions of a sentence, such as that a sentence expresses a complete thought, or consists of a subject and predicate, are unsatisfactory. Nor can punctuation in written language be taken as a reliable guide since punctuation is somewhat arbitrary and sometimes incorrectly marked. The definition of a sentence must be related to spoken speech. Here, there are three kinds of signals by which the native speaker recognizes sentence divisions: pitch, stress, and juncture (the pauses in the flow of an utterance). Contrast the following sentences:

---

[1] Throughout, the writer has drawn heavily on examples of different syntactic structures from Francis (1958).

(a) Had he come earlier, we couldn't have seen him.
(b) Had he come earlier? We couldn't have seen him!

If these are read aloud, one can see that the signals that differentiate (a) from (b) are the differences in the patterns of pitch of certain words, the stress on certain words, and the length of the pause between the two sentences in (b)--juncture. The signals denoting sentence divisions may be called sentence-completing intonation patterns.

The minimum criterion for a sentence is that it be an uninterrupted utterance, bounded by silence or change of speaker. A sentence, then, may be defined as being as much of the uninterrupted utterance of a single speaker as is included between the beginning of the utterance and the pause which ends a sentence-completing intonation pattern. Sentences may vary from single words to elaborate syntactic structures. The precise demarcation of sentences depends on their being read aloud. Take the following conversation as an illustration:

A. Hello, John.
B. Hello. Beautiful day, isn't it? (Contrast with: Hello. Beautiful day. Isn't it? In this case, there is a longer pause after day and the intonation pattern is different.)
A. It certainly is perfect for fishing. (Contrast with: It certainly is. Perfect for fishing.)
B. That's what I'd like to be doing. But I have to work. (Contrast with: That's what I'd like to be doing, but I have to work.)

Sentence Fragments, Verbal Tics, and Language Mazes

Parts of utterances resulting from interruptions to the speaker are sentence fragments if they are not completed after the interruption. (Note that the interrupting pause in such instances does not signal a sentence-completing intonation contour.) If the interrupted sentence is completed subsequently, the utterance is counted as a sentence.

A verbal tic is a speech habit that has little or no more syntactic status than nonlinguistic speech habits such as occur in stuttering. Examples are repetition of single words when not done by the speaker deliberately for emphasis ("He . . . he looked at the mouse"); repetition of stereotypes ("And, y'know, then the lion and the mouse, y'know;" "The lion, see, saw the mouse, see"); and the habit of stringing clauses together by and when no true coordination is intended.

Language mazes are false starts and garbled phrases with no apparent meaning ("Then the lion . . . and he . . . then the mouse peeped out of his hole"). Here grammatical incorrectness, however, does not constitute a maze.

Sentence fragments, tics, and mazes are excluded from the scoring. Asides to the child are also excluded (but not questions about whether the child understands--unless the questions are verbal tics). Admonition to pay attention and questions to the interviewer about what the subject is supposed to do are asides and are excluded.

Mean Pre-verb Length

Scale Description

The mean pre-verb length is obtained by dividing the total number of words appearing before the main verb of all clauses in the protocol (excluding imperatives and interrogatives) by the number of counted clauses (excluding imperative and interrogative clauses). Imperative and interrogative clauses are excluded (from both numerator and denominator) because by convention the main verb occurs first in such constructions, thereby obviating the possibility of pre-verb elaboration.

Where a dependent (subordinate) clause is embedded in an independent (main) clause, the main clause is treated separately from the imbedded subordinate clause and the latter is treated by itself. Example:

A friend, whose house burned down, came to see me.

This example is divided into two units of analysis:

(a) A friend came to see me (two words before the main verb)
(b) whose house burned down (two words before the main verb of the subordinate clause)

There is one case requiring special analysis, namely, when the subordinate clause is itself the subject of the sentence; for example:

(a) That he is a scoundrel is well known.
(b) Who he is is a mystery.
(c) What you think does not interest me.

In such instances, the number of words in the subject (noun) clause are counted as the number of words preceding the main verb of the sentence. However, the subject clause is included as a unit of analysis by itself.

Adjective Range

Scale Description

The adjective scale is based on the following index:

$$\frac{\text{Number of uncommon adjectives (excluding repetitions)}}{\text{Total number of words used as nouns}} \times 100$$

Definition of Uncommon Adjectives

The category, uncommon adjectives, excludes numerical, demonstrative, and pronominal possessive adjectives (my, your, his, her, its, their); the articles (a, an, the); "other;" and "another."

Definition of Adjectives

The category, adjectives, includes not only words defined traditionally as adjectives, but also nouns and verbs used as modifiers of nouns. Nouns as modifiers of other nouns include those of possessive construction and those of noun-adjunct construction. Examples:

Possessive	Noun-adjunct
child's play	child psychology
a day's work	a father image
	a dining table (gerund acting as modifier)

The following are examples of verbs functioning as modifiers of nouns:

running water — money to burn
baked potatoes — the man to see

Note that some words ending in -ing are not necessarily participles or gerunds, but adjectives:

a pleasing table (synonym for pleasant)
an interesting story

Predicate adjectives are included in the adjective count. Predicate adjectives are linked to the subject by linking verbs. Examples:

The lion	was became seemed remained looked sounded	hungry (predicate adjective)

Substitution of be without altering the basic syntactic structure can be used as a test for whether a verb is linking (copulative) or not. Some linking verbs require careful analysis:

The weather turned cold (cold is an adjective)
The wind blew a gale (gale is a noun)

Adjectives may occur as objective complements:

He painted his house green.

Tallying Procedure

Denominator. Count every word used as a noun, including all repetitions. The sum becomes the denominator in the index.

Numerator. Count each uncommon adjective once only.

Computation of Index

Multiply the numerator by 100 (to remove the decimals) and divide the result by the denominator.

Adverb Range

Scale Description

The adverb scale is based on the following index:

$$\frac{\text{Number of uncommon adverbs (excluding repetitions)}}{\text{Total number of verbs, adjectives, and adverbs}} \times 100$$

Definition of Uncommon Adverbs

The category, uncommon adverbs, excludes "here," "there," "now," "then," "less," "least," "more," "most," "just," "not," "yes," "no," "how," "when," "where," "what," and "why."

Adverbs in Verb Phrases

A number of verb phrases are composed of a form that also can appear as an independent verb together with a form that also can appear as an adverb, or as a preposition used as an adverb. Some grammarians treat these verb phrases as single grammatical elements. However, in this study, the adverbs and prepositions acting as adverbs are treated as adverbs. Examples:

He	takes puts gets throws holds gives makes plays	it	over. out. up.

Note that *over*, *out*, and *up*, which are here used as adverbs, may also function as prepositions, in which case they are excluded from the adverb count. The distinction between these words as adverbs and as prepositions may be brought out in the following ambiguous sentence.

He looked over the fence.

If the inversion, "He looked the fence over," is intended as the meaning, the word *over* is an adverb, part of the verb phrase *look over*. If the intended meaning is to convey where he looked, *over* is a preposition, the object of which is *the fence*. The distinction in use is determined by context and by different stress and pitch patterns when the sentence is spoken.

Adverbs as Verb Modifiers

Adverbs most commonly modify verbs. These adverbs are included in the adverb count. Examples:

He speaks *seldom*.
He drives *rapidly*.
He was looking *sidewise*.
He has *sometimes* seen.
He *never* comes *home*.
The train moved *ahead slowly*.

Adverbs as Adjective Modifiers

The most frequent qualifiers of adjectives are adverbs. Examples:

The	very[2] rather[2] quite[2] exceedingly somewhat[2] still	angry	lion.

When the adjective is in the predicate after a linking verb, a following adverb may seem to modify it. Some grammarians believe that the adverb in this position modifies the whole structure of complementation of which the adjective is a part. Examples:

---

[2] In the newer grammars, these are considered *function* words which can act as qualifiers. Traditionally, they have been considered adverbs, as here.

It is dark ahead.
The house seems clean everywhere.
The air feels fresh inside.

Such adverbs are included in the adverb count.

Adverbs as Adverb Modifiers

Adverbs may modify other adverbs. Examples:

very easily
rather slowly
happily enough
far away
rather too strong
almost all over
much more easily (count much but not more as the latter is excluded by definition of uncommon adverbs)

Adverbs and Other Words Not Counted

The following are not counted as adverbs:

Adverbs as noun modifiers.

his speaking rapidly
our acting together

Speaking and acting are participal forms used as nouns (i.e., gerunds). Some grammarians consider the following, also, as examples of adverbs modifying nouns:

the people here
the temperature outside
the conversation afterwards

However, they may also be viewed as examples of elliptical expressions:

the people (who are) here
the temperature outside (here) or the outside temperature (outside as adjective)
the conversation (held) afterwards

In the first example, here could be construed as modifying the understood verb are. In the next example, outside may be viewed as modifying here or the phrase may be considered as an inverted structure. In the third example, afterwards may be viewed as modifying the understood verb held. Since there is a difference of opinion on the classification of the words in the illustrations and since the syntactic constructions in which they occur are quite rare, the words are not counted as adverbs in the adverb count.

Adverbs as preposition-modifiers. Adverbs sometimes modify prepositions. These adverbs are not included in the adverb count. Examples:

slightly off pitch
almost beneath notice
very like a fish

Nouns as adverb-modifiers. Nouns, sometimes, though very rarely, modify adverbs. These nouns are not counted in the adverb count. Examples:

a foot away
some way up

Nouns, verbs, and adjectives as adjective-modifiers Nouns, verbs, and adjectives infrequently modify adjectives. They are not counted as adverbs. Examples:

nouns:	stone cold coffee bone dry earth
verbs:	freezing cold boiling hot hopping mad
adjectives:	dark blue cold sober icy cold

Tallying Procedure

Denominator. Count every adjective, adverb, and verb in the protocol, including all repetitions. Verb is defined in connection with the Verb Elaboration Scale (see below). A verb phrase is counted as one verb. Verb phrases may be quite elaborate (would have been about to leave). Various individual verbs within the verb phrase may be modified (would scarcely have been about to leave quietly). Count each adverb (for the adverb count) but count the entire verb phrase as only one verb (for the verb count). The sum of the adjectives, adverbs, and verbs becomes the denominator.

Numerator. Count each uncommon adverb once only. The sum becomes the numerator of the index.

Computation of Index

Multiply the numerator by 100 and divide the result by the denominator.

Verb Elaboration Scale and Complex Verb Preference

Scale Description

English verbs exhibit both formal and functional distinctions representing different verb forms. Each different type of verb form is classified on the basis of its defining attributes. All members of each class must have the same formal and functional defining attributes. Each class is counted as a separate verb type.

Verbs Classified by Structure and Function

Structures of predication. The kernel sentence consists of a subject and a predicate. The verb predicates or affirms something about the subject (noun, substantive). A predicate may be a structure of complementation.

Structures of complementation. Structures of complementation have two basic components: a verbal element and a complement. The complement may be an indirect object, a direct object, a subjective complement, or an objective complement.

Verbs fall into three main functional groups, which may be identified by the types of structure in which their members are found and by certain other formal characteristics: linking (or copulative) verbs, intransitive verbs, and transitive verbs.

Linking verbs. Linking verbs link subject and complement; they never occur without a complement. The most common linking verb is *be* (as a full verb, not as an auxiliary). Substitution of *be* can be used as a test for whether other verbs are linking verbs. If the appropriate form of *be* can be inserted into a structure of complementation in place of another verb without making major changes in the *structural* meaning, the original verb is a linking verb. Examples:

The man	was became seemed remained looked sounded	hungry.

Linking verbs have no passive form. (However, some linking verbs have homonyms which do have passive forms.) Since intransitive verbs also lack passives, this test is of limited value.

Intransitive verbs. Verbs which may appear in the active voice as complete predicates without any complement are intransitive verbs. They have no passive forms. They cannot appear as verbal elements in structures of complementation. Examples:

The machine is running.
The rain stopped.
The sun sinks slowly.
The curtain rose.

Note that *run*, *stop*, and *sink* have transitive forms as well.

Transitive verbs. Verbs which always have a complement when in the active voice and which have passive forms are transitive verbs. When a passive form is substituted for an active form, the complement or a part of it must be made the subject if the meaning is to be preserved. Examples:

Active Form	*Passive Transformation*
The man sold his car.	The car was sold (by the man).
The wind blew down the house.	The house was blown down (by the wind).

As previously mentioned, since some verbs have homonyms with active and passive forms and since, also, some transitive verbs have homonyms which are linking verbs, it is essential to observe a verb in its grammatical context to classify it accurately. Examples:

Linking:	The weather turned cold. The wind blew a gale. The music sounded loud.
Intransitive:	The earth turns. The wind is blowing. The fire alarm sounded.
Transitive:	The car turned the corner. The musician blew the trumpet. The watchman sounds the alarm.

Complements appearing with linking verbs are subjective complements. Objects are complements appearing with transitive verbs.

Formal Qualities of Verbs

Verbs may be distinguished by their formal qualities into seven heads: person, tense, phase, aspect, mode, voice, and status.[3]

Person. All English verbs except modal auxiliaries (can, may, shall, will, must, dare, need) have two persons--common and third singular. Examples of the third singular are:

The man walks.
This looks good.
Eating candy causes tooth decay.

Examples of the common form:

Dogs bark.
I walk.
They shine brightly.

The verb be, whether as a full verb or as an auxiliary, has an additional form, the first-singular am (as in I am) and a common person form are (as in they are).

Tense. All English verbs except a few auxiliaries (ought, must) have two tenses, the common (or present) tense and the past (or preterit) tense.

Phase. English verbs except a few auxiliaries have two phases, the simple and the perfect, which is marked by the use of various forms of the auxiliary have with the past participle form of the verb. Examples of the perfect phase:

He has spoken.
We may have been.
I should have worked.
He has gone.

Intransitive verbs have a resultative phase, formed with the auxiliary be and the past participle form of the verb:

He is gone.
They are finished with the work.
I am done with you.

Verbs not in the perfect or resultative phase are in the simple phase.

Aspect. Verbs have three aspects: the simple, the durative, and the inchoative. The simple aspect is unmarked. The durative is formed by the auxiliary be and the present participle:

He is talking.
She was swimming.
We ought to be working.

The inchoative aspect is formed by the auxiliary get and the present participle:

We got talking.
Let's get going.
We ought to get working.

Modes. Verbs have a variety of modes. The modes can be classified on the basis of form into two groups: (a) those formed by the modal

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[3] The terminology used here generally (though not completely) follows that of Trager and Smith (1951) and Francis (1958).

auxiliaries and the base form of the verb, and (b) those formed by certain other auxiliaries and the infinitive. The modal auxiliaries are *can*, *may*, *shall*, *will*, *must*, *dare*, *need*, *do*. The auxiliaries which form modes with the infinitives are *have*, *be*, *be going*, *be about*, *used*, *ought*, *get*, *have got*. Auxiliaries appearing with the present participle exemplify the durative aspect (if the auxiliary is a form of *be*) or the inchoative aspect (if the auxiliary is a form of *get*). The auxiliary forms of *have* appearing with the past participle exemplify the perfect phase. Forms of the auxiliary *be* appearing with intransitive verbs illustrate the resultative phase.

As noted above, auxiliaries are of two forms, modal and other. Auxiliaries may also be classified on the basis of the form of the main verb with which they appear.

Auxiliaries appearing with the *base* form of the verb:

can/could
will/would
dare
may/might
do/does/did
need
shall/should
must
(had) better/best

Auxiliaries appearing with the present participle:

am/is/are/was/were
get/gets/got

Auxiliaries appearing with the past participle:

am/is/are/was/were
get/gets/got
have/has/had

Auxiliaries appearing with the infinitive form of the verb:

have/has/had
ought
used
am/is/are/was/were
get/gets/got
am/is/are/was/were $\left\{\begin{matrix}\text{about}\\ \text{going}\end{matrix}\right.$

A verb phrase may belong to two modes at the same time. In such a case, only one may be from the modal auxiliary group, and its auxiliary always comes first in the phrase:

He would have to work.
He could be about to work.
She may be going to tell us.
They used to have to work.

It may be seen that auxiliaries may combine with one another to build quite elaborate verb phrases, which themselves act as auxiliaries of full verbs:

was going
might have been going
used to have to be going
was getting going

might have fed
can get fed
will be fed
has been fed
might have been fed
was being fed
should have been getting fed
used to have to be getting fed

might have had to go
has been going to eat
would have been about to leave
ought to have gone
used to be being fed
was to have been told

Auxiliaries may be used in elliptical expressions:

I will (come) if I can (come).
I guess I had better (come).
Must I (come)?
Yes, I am (coming).
I already have (come).
I suppose I have to (come).
I guess I ought to (come) though I never used to (come).
I'm going to (come) pretty soon.

Voice. English verbs have two voices, active and passive. Examples of the active voice:

He kills.
They built a house.
We have done the work.

Passive forms consist of some form of the auxiliary *be* with the past participle form of the verb. Passive forms using *get* as the auxiliary with the past participle shall also be counted as instances of the passive voice even though grammarians are not agreed as to the status of the *get* form of structure.

be - passive	*get - passive*
He is killed.	He gets killed.
The house was built.	The house got built.
The work has been done.	The work has got done.

It is important to distinguish subjective complements from instances of the passive voice. The two may be alike in form. Two syntactic structures that are exactly alike in the written form and that are sometimes alike in speech are the passive form of *be* and *be* with a past participle as subjective complement. Consider the following:

The house was built by experts.
The house was built of wood.

In the first sentence, there is a passive verb, *was built*, modified by the prepositional phrase *by experts*. In the second sentence, the verb is *was*, with the structure of modification, *built of wood*, serving as subjective complement. Apart from the juncture (in speech), which may indicate where the division between the immediate constituents of the predicate falls (either before or after *built*), the only way these structures can be formally distinguished is by means of the presence, actual or possible, of a phrase containing the preposition *by*. The latter always indicates the passive. Further examples:

Passive:	The man was informed by his wife. The student was interested by his teacher in studying.
Subjective complements:	The man was informed about politics. The student was interested in studying.

Note that the context may indicate that the latter are not actually subjective complements, as when the meaning is as follows:

The man was informed about politics by his wife.
The student was interested in studying by his teacher.

Status. English verbs have six statuses: the affirmative, the imperative, the interrogative, the negative, the negative-imperative, and the negative-interrogative. The imperative is marked by ellipsis of the subject:

Be careful.
Love your neighbor.

The interrogative status is marked by a change in word order involving inversion of the subject and the auxiliary or the first auxiliary if more than one are present. Verbs which have no auxiliary in the affirmative status use the auxiliary do/does/did to form the interrogative, except *be*, which simply inverts subject and verb, and *have*, which may invert or may use forms of *do*. The auxiliaries *get*, *used* (*to*), and *have* (*to*) also use forms of *do*. Examples:

Inverted forms
Is he working?
Has he worked?
Should he have worked?
Is he going to work?

do-forms
Does he work?
Did he work?
Did he get killed?
Does he have to work?
Did he use to work?

The negative status is marked by insertion of the word *not* immediately after the first auxiliary. The forms of *do* are used if no auxiliary is otherwise present, but *do* is not used with *be* (except in the imperative) and not always with *have*. The forms of *do* are used when the auxiliary is *used* (*to*), *have* (*to*), or a simple form of *get*. Examples:

He is not working.
He has not worked.
He should not have worked.
He is not going to work.
He does not work.

He is not here.
He has not any money.
He does not have any money.
He did not used to work.
He used not to work.

The negative-imperative status is marked by insertion of the word *not* after the verb (not necessarily immediately after it) or by use of forms of *do* and the word *not*. Examples:

Ask not for whom the bell tolls.
Ask him not.
Do not ask for whom the bell tolls.
Don't ask it of me.

The negative-interrogative status combines the interrogative and the negative. The use of the auxiliary *do* follows the same pattern as in the interrogative forms. There are two forms:

not - first form	*subject - first form*
Isn't he working?	Is he not working?
Hasn't he worked?	Has he not worked?
Shouldn't he have worked?	Should he not have worked?
Doesn't he work?	Does he not work?
Hasn't he any money?	Has he not any money?
Doesn't he have any money?	Does he not have any money?

The Verb DO

The verb-substitute DO. The verb *do* and its various inflectional and phrasal forms may appear in place of any full verb that has alread appeared in the immediate linguistic context. Examples:

He works harder than I do.
It sounds better than it did before.
I am already doing it.
He has accomplished more in a week than I have done in a year.

DO as auxiliary.

Do you often go to the movies?
He does look like that.
How *do* you do?

DO in elliptical expressions.

He liked it but I didn't.
I go there frequently; do you?

DO as a full verb.

He does a great deal of work.
How do you *do*?
We must do better.

Separable Verbs

Separable verbs were previously discussed in connection with the adverbial component of verb-adverb combinations. The verb component of these combinations is treated as the verb form. Examples:

	takes		
	puts		over.
He	gets	it	out.
	throws		up.
	holds		

When a noun is substituted for *it* in the above construction, the adverb component may come next to the verb component:

He puts his message over, OR
He puts over his message.

Same Verb Form with Different Functions

The function of a verb is one determinant of its form. If the morphemically same verb form plays different roles (appears in different syntactic structures), each role is counted as a separate verb form. One situation requires that a distinction be made between structures of modification and structures of complementation. In structures of modification, nouns may function as verb modifiers. Examples:

He lived a year.
He walks this way.
He saw a mile.

Year, *way*, and *mile* are not objects of the verbs. On the other hand, in structures of complementation, the noun is the object of the verb. Examples:

He lived his life.
He likes his own way.
He measured a mile.

If an adjective occurs in a structure of modification of a verb, a different verb form results:

The children ran wild.
The dog went crazy.
The show fell flat.

Note the subtle difference between the above forms and those shown in structures of complementation.

Another verb form occurs where a verb modifies a verb:

The children came running.
I prefer to eat sitting.
He lives to eat.
They came to pray.

Another verb form occurs when a verb is the object of a verb:

He loves to eat.
He wants to succeed.

Where the main (or head) verb may be both intransitive and transitive, ambiguity may result, as in:

He loves to live.

There is no way to tell, either in speech or in writing, whether this means "he loves in order that he may live" or "he loves the act of living." The decision, however, can probably be made by contextual clues.

Another verb form occurs where an infinitive phrase is a structure of predication:

I asked *him to call*.
I know *them to have been told*.

Another verb form occurs in the case of the verb complement:

We watched *them* go.
We heard him singing.

Ambiguous Cases

The following are ambiguous:

Driving slow annoyed him.
Driving slowly annoyed him.

In such cases, the participle form is counted as a noun, not a verb, as in the following examples of verbal nouns:

My driving slow annoyed him.
My driving slowly annoyed him.
My slow driving annoyed him.

However, in the following case, the form is a verb and it is the entire clause which is the noun:

Driving a car slow annoyed him.

The presence of a direct object (*car*) distinguishes this case from the foregoing verbal nouns.

When verbs are objects of prepositions, they are counted as nouns, not as verbs:

a way of doing
a day for resting

But, note the following, which are verbs, because the entire phrase is the object of the preposition and the participle acts as a verb within the phrase:

a way of doing it
a day for resting your limbs

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As described under the Adjective Scale, verbs used as adjectives are classified as adjectives, not verbs:

running water
baked potatoes
the man to see

Tallying Procedure

Count the number of different complex verb form types--verb forms containing two or more elements in the verb phrase (or stem), excluding repetitions.

Count the number of simple (single-word) verb form types.

Verb Elaboration is based on the index:

$$\frac{\text{Complex verb forms}}{\text{Total number of sentences (as defined earlier)}}$$

Complex Verb Preference is based on the index:

$$\frac{\text{Complex verb forms}}{\text{Total number of verb form types, simple and complex}}$$

Syntactic Structure Elaboration Scale

Scale Description

The structure elaboration scale is based upon the following index:

$$\frac{\text{Total number of complex syntactic structures, weighted as described below}}{\text{Total number of sentences (as defined earlier)}} \times 10$$

Definition of Complex Syntactic Structures

Complex syntactic structures, as used herein, include the following types of structures: (a) coordinate clauses, (b) subordinate clauses, and (c) certain types of structures (hereinafter described) including those which are considered phrases by some grammarians and clauses by others, and phrases which are syntactic equivalents of clauses.

Definition of Clause Coordination

A structure of coordination consists of two or more syntactically equivalent units joined in a structure which functions as a single unit. Where the syntactically equivalent units are clauses (clauses are basically structures of predication), they are coordinate clauses. A structure of coordination which has more than two components is called a series. Example of a clause coordination:

The house was painted white and the barn was painted red.

Clause coordination may involve elliptical structures:

The house was painted white and the barn (was painted) white.

In structures of coordination, it is sometimes difficult to be sure about the level on which the coordination takes place. Such structures are frequently structurally ambiguous:

(a) He was born and lives in Chicago.
(b) He was born and lived for forty years.

In (a), the coordination occurs at the verb level and is not an instance of coordinate clauses. The phrase in Chicago modifies a compound verb, was born and lives. In (b), the meaning tells us that a person cannot be born for forty years. The phrase for forty years modifies only lived. Hence, we may assume that (b) is coordinated at the clause level and syntactically is an ellipsis having the same meaning as the following sentence:

He was born and he lived for forty years.

It may be noted that (a) could be construed as an elliptical construction:

He was born (in Chicago) and (he) lives in Chicago.

The probability is greater that (a) is an example of verb coordination. Of course, the following sentence is unquestionably a true clause coordination:

He was born in Chicago and he lives in Chicago.

Another example of a structurally ambiguous sentence is the following:

He is either extremely clever or totally mad.

The ambiguity is caused by the inclusion of the qualifiers, extremely and totally. Without them the sentence would read:

He is either clever or mad.

It becomes clear that this is a compound predicate adjective and not a coordination of clauses. In the following, however, we do have a clause coordination:

Either he is extremely clever or (he is) totally mad.

Very real problems are presented by structures which are rhetorically poor but which occur nevertheless in speech and writing. Examples:

(a) He not only came to town but to my house.
(b) I either must sell my car or my furniture.
(c) He is not only intelligent but he has a good education.

Sentence (a) could be interpreted as an instance of a compound predicate as in the following inversion:

He came not only to town but to my house.

However, it seems better to treat it as an elliptical structure of clause coordination:

He not only came to town but (he also came) to my house.

In (b) there are several reasonable versions:

I either must sell my car or (I must sell) my furniture.
Either I must sell my car or (I must sell) my furniture.
I must sell either my car or my furniture.

The first two are clause coordinations; the third is a compound direct object. As in the case of (a) above, the preferred treatment is to consider (b) as an instance of clause coordination.

Sentence (c) is a split structure. The first part of the correlative (not only) is erroneously inserted in the middle of the first component of the structure of coordination. By shifting the word order, a better sentence is manufactured:

Not only is he intelligent but he has a good education.

This is clearly a structure of clause coordination.

Although it is difficult to formulate an unequivocal rule regarding the interpretation of elliptical constructions, care should be taken not to resort to the indiscriminate use of "understood elements" found in some traditional grammars. Example:

He is bigger than I (am big).

This method of creating a structure of clause coordination in unwarranted.

Subordinate Clauses

In traditional grammar, the two major types of clauses are *main* (or *independent*) clauses and *subordinate* (or *dependent*) clauses. Subordinate clauses involving reference to an antecedent are called *relative* clauses. Subordinate clauses come in a wide variety of types, and only some of the types will be illustrated.

The fact *that it is raining* is discouraging.	(modifies *fact*)
We heard the news *that the war is over*.	(modifies *news*)
He came *after I left*.	(modifies *came*)
I will go *wherever you go*.	(modifies *will go*)
so hungry *that I could eat an ox*	(modifies *hungry*)
stronger *than he was before*	(modifies *stronger*)
He walked *so* slowly *that he hardly moved*.	(modifies *slowly*)
He studies harder *than I ever did*.	(modifies *harder*)
He drove the car *as if he was going to a fire*.	(modifies *drove the car*)
When he comes we will go.	(modifies all the rest of the sentence)
If it rains, close the windows.	(modifies all the rest of the sentence)

Relative Clauses

the team *that scores highest*
a boat *which I sail*
He is not the man *that he once was*.
the story *to which he referred*
the man *that I gave it to*
Whatever you do I shall follow my own desires (modifies rest of sentence).
No matter who he is, I don't like him (modifies rest of sentence).
Never mind if it's raining, we'll have the picnic (modifies rest of sentence).

Clauses as Subjects

That he is a scoundrel is well known.
How you do it is important.
Who he is is a mystery.
What you think does not interest me.

Clauses as Complements

Tell him *that I am here*.	(direct object)
This is *where I get off*.	(subjective complement)

Give *whoever comes* the message.	(indirect object)
His wife made him *what he is*	(objective complement)
He is friendly with *whoever will flatter him*.	(object of preposition)

Infinitive Clauses

Infinitive clauses are clauses whose constituents are a relative pronoun and an infinitive. The are counted as clauses. Examples:

What to do is my problem.
She does not know *where to go*.
The problem is *who(m) to ask*.
A place *in which to work* is what I want.

Other Infinitive Structures

There are several other types of infinitival structures which are usually classified as phrases, but which are relatively complex syntactic structures and are included in the Structure Elaboration Scale. Examples:

To be sure, he didn't mean it.
To drive well, you must be alert.

These structures modify the rest of the sentence. They should not be confused with infinitives modifying nouns:

His wish *to be admired* is an obsession.

The phrase *to be admired* acts as an adjective, modifying the noun *wish*.

Another infinitive structure, generally classified as a phrase, shall be included in the Syntactic Structure Elaboration Scale. Examples:

I asked *him to call*.
He told *John to come at ten*.

Participial Structures

Participial structures are generally classified as phrases. However, they are included in the Syntactic Structure Elaboration Scale. Examples:

Continuing with our story, the next chapter is a sad one (dangling participle).

Note the similarity of this to the infinitival structure (which is also counted): *to continue with our story*.

Following a good dinner, we heard a brief speech.
It rained heavily, *turning the field into a sea of mud* (trailing participle).
The job, *considering the short time*, was well done (medial participle).

Participial structures shown above are not to be confused with *absolute constructions*, which act as noun modifiers, i.e., adjectives. Examples:

The vans *having arrived* we were ready to move.
The work *finished* we went home..

Elliptical Structures

The following types of elliptical structures shall be counted:

Although (he was) hungry, he did not stop.

After (we had) dinner, we talked. (most grammarians treat after dinner as a phrase)

While (he was) at college, he fell sick.

The cake should be removed from the oven when (it is) done.

However strong (it is), coffee never keeps me awake.

Never drink while (you are) driving.

Elliptical structures may be instances of relative clauses:

(a) a place (to which, where) he goes in summer
(b) a story (which) I heard
(c) the man he told his story to (ellipsis and inversion of to whom he told his story)
(d) That man, I know, is honest.
(e) The door, he told us, will be open.
(f) You were our friend, I thought.

Note that (d), (e), and (f) are essentially the inverse of the following sentences. In the former, the interpolated clauses are subordinate. In the following, the clause status is reversed:

(g) I know (that) that man is honest.
(h) He told us (that) the door will be open.
(i) I thought (that) you were our friend.

Though the structures are subtly different, the clause count is the same in both types of structures.

(j) The trouble is (that) he can't swim.
(k) (That) He doesn't try is the reason for his failure.

Infinitive structures may also contain ellipses:

He told John to come at ten and Bill (to come) at noon.

Weighted Index of Structures

The following system, based in part on Loban's weighted index of subordination, is used for weighting the types of structures included in the Syntactic Structure Elaboration Scale:

Simple coordination: one point. Example: He was afraid and he was lonely. Credit is given for the act of coordination, not for each coordinate clause.

A series of coordination: one point for each member of a series of coordination except the first. Example: He had his pipe and he had his bowl and he had his fiddlers three. This counts two points. The following also counts two points: He had his pipe, he had his bowl, he had his fiddlers three.

Coordination of Complex Syntactic Structures: one point for the act of coordination and one point for each of the coordinated clauses. Examples:

He went to the store because he was hungry and (because) he could get food there.

He told John to come at ten and Bill to come at noon.

The total count in these cases in three points.

Structures other than clauses: one point for each syntactic structure other than subordinate clauses. This includes so-called infinitive clauses, other infinitive structures, participial structures, and elliptical structures not otherwise covered under subordinate clauses.

Simple subordination: one point. Example: He was afraid because he was lonely. The man who was wearing a green hat went home. These are called first-order dependencies.

Second-order dependence--unembedded. A dependent clause modifying (but not embedded within) another dependent clause counts two points. The modified dependent clause gets one point, making a total of three points. Example: The man who was wearing a hat, which was green . . . The second clause modifies the first.

Second-order dependence--embedded. A dependent clause *within* another dependent clause (or a complex syntactic structure embedded within another) counts three points. Example: Although the man, who was wearing a hat, stood up . . . The relative clause is embedded within the subordinate clause. Counting one point for the subordinate clause and three points for the embedded clause, this type of structure counts four points.

Third-order dependence. Because third-order dependence is so rare, differentiation between embedded and unembedded structures need not be made at this level. A third-order dependence consists of a dependent clause (or complex structure) modifying or embedded within another dependent clause which, in turn, modifies or is embedded in another dependent clause. Third-order structures are given four points. Example: The mouse knew that if the lion, who was fierce, came out, he would be eaten up. The noun clause object of *knew* (*that if the lion, who was fierce, came out, he would be eaten up*) counts one point. The embedded clause, *if the lion . . . came out*, counts three points. The clause, *who was fierce*, counts four points. The total, then, is eight points. Parsing the three points may help the analysis:

(a) that . . . he would be eaten up
(b) if the lion . . . came out
(c) who was fierce

The following structure also would receive eight points: Although the man who was wearing a hat which was green stood up . . .

Dependence on coordinate clauses. A clause subordinate to a coordinate clause does not increase its value, but is counted one point. Example: He had a pipe and he had a cane because he had hurt his foot. One point is counted for the coordination and one point for the subordinate clause, *because he had hurt his foot*.

Repeated pairs. Repeated subject-verb pairs are not counted in the clause count. He thought and he thought gets no point for coordination.

Tallying Procedure

Denominator. Count the total number of sentences (as defined).

Numerator. Count each complex syntactic structure in accordance with the weights accorded each, including all repetitions of similar types of structures. The total becomes the numerator.

Computation of Index

Multiply the numerator by 10 and divide the result by the denominator.

Stimulus Utilization Scale
(for use with projectives)

Scale Description

The stimulus utilization scale is simply the number of characters and objects (including parts of characters) present in the projective test picture which the subject uses in the story he reports.

Introduced Content Scale
(for use with projectives)

Scale Description

The content elaboration scale is simply the number of different characters and objects (including parts of characters) not present in the picture but introduced by the subject in his story.

Abstraction Scale

Scale Description

The abstraction scale is based upon the following index:

$$\frac{\text{Number of abstract nouns and verbs (excluding forms of } \underline{\text{be}} \text{ and excluding repetitions)}}{\text{Sum of the above plus concrete nouns and verbs (excluding forms of } \underline{\text{be}} \text{ and excluding repetitions)}} \times 100$$

Definition of Abstract and Concrete

Dictionary and traditional grammar book distinctions between "abstract" and "concrete" are not suitable guides to the true distinction between abstract and concrete words since they make the assumption that words are either concrete or abstract because of their form. As Sheffield (1912) demonstrated, *any* noun, whether the name of a thing or of an attribute, is abstract when it is thought of apart from the cases in which it is actually experienced. Conversely, when thought of as realized in objects and instances, it is concrete. So-called "abstract" nouns may have concrete meaning just as much as other nouns. Whiteness, when thought of as the quality of whiteness, is abstract. However, *a whiteness* is an object and concrete. Webster cites poem as a concrete noun and poetry as an abstract noun. Yet, when we say that the poem is a form of writing, we are using it as an abstract noun. When we speak of Keats' poetry (intending his poems), we are using *poetry* as a concrete noun.

Words apart from context are neither abstract nor concrete. The true distinction between abstract and concrete lies in the proposition being expressed. To make the distinction, one must rely on meaning and context. Examples:

Abstract	Concrete
Beauty is a rare quality.	She is a beauty.
The lion is an animal.	The lion stalked his prey. By nightfall the animal was tired.

Another sometimes useful guide to differentiating between abstract and concrete words is the degree of inference one has to make about the referent or referents of the word. This may be especially helpful in classifying verbs. Where the verb describes a specific action or event so that the predication is definite and specific, the verb is concrete. The greater the degree of inference one must employ as to what the verb is describing or affirming, the greater the likelihood that the verb is abstract. Examples:

Concrete	Abstract
He walked home	He walked alone through life.
He went to the store.	He went out of his mind.
He erred in his calculations.	To err is human.
She loves him.	Love thy neighbor.

Tallying Procedure

Denominator. Count each different noun and verb in the protocol. Different forms of the same root word are counted as separate words. The sum of the nouns and verbs becomes the denominator in the index.

Numerator. Count each different abstract noun and abstract verb. Different forms of the same root word are counted as separate words. The sum of the abstract nouns and verbs becomes the numerator of the index.

Computation of Index

Multiply the numerator by 100 and divide the result by the denominator.

Summary Measures of Maternal Language Elaboration

Language Factor Score

A principal component factor analysis was done using scores on the various language scales from all three language samples. The factor structure included a single factor composed of Mean Sentence Length, Mean Pre-verb Length, Verb Elaboration, and Syntactic Structure Elaboration. These four measures on the three language samples were submitted for a second principal component factor analysis; factor scores on the first rotated factor were obtained for each subject. The factor scores range from high negative (high elaboration) through a 0 midpoint, to high positive (low elaboration).

Language Elaboration T Score (LET)

Scores for Mean Sentence Length, Mean Pre-verb Length, Verb Elaboration Scale, and Syntactic Structure Elaboration Scale, were converted to z scores, separately for each of the three language samples, for each subject.

The mean z score across the four scales was computed within each language sample for each subject (sum of z scores on four scales, divided by 4). Finally, the mean z score was converted to a T score within each language sample, for each subject (T = 50 + 10 [mean z score]).

Average LET Score

For each subject, the three LET scores--for three language samples--were summed and divided by 3, to provide an Average LET Score. The Average Language Elaboration T Score summarizes the subject's scores on four language scales across three language samples.

APPENDIX P

PROCEDURES FOR RATING CHILD'S BEHAVIOR DURING ADMINISTRATION OF THE STANFORD-BINET

The standard record booklet for the Stanford-Binet Intelligence Scale, Form LM, contains a list of factors affecting test performance. Thirteen pairs of behavioral descriptions are provided:

Attention:	
absorbed by task	easily distracted
Reactions during test performance:	
normal activity level	hyperactive or depressed
initiates activity	waits to be told
quick to respond	urging needed
Emotional independence:	
socially confident	shy, reserved, reticent
realistically self-confident	distrusts own ability or overconfident
comfortable in adult company	ill-at-ease
assured	anxious about success
Problem solving behavior:	
persistent	gives up easily or can't give up
reacts to failure realistically	withdrawing, hostile, or denying
eager to continue	seeks to terminate
challenged by hard tasks	prefers only easy tasks
Independence of examiner support:	
needs minimum of commendation	needs constant praise and encouragement

The rating scale which appears at the top of this list of behaviors allows for ratings to be made from "optimal" to "seriously detrimental." Examiners were asked to rate the subject on each of the thirteen behaviors, by marking a check along the horizontal axis provided by the paired descriptions and the dotted line connecting them, placing the check mark below the appropriate qualitative description as provided by the rating scale at the top.

The rating scale, from left to right, includes five qualitative categories:

Optimal   Good   Average   Detrimental   Seriously Detrimental

The ratings were later quantified by assigning numbers to each of these categories (from 1= optimal, to 5= seriously detrimental); the numerical ratings assigned each subject included half-points for check marks made not directly below a qualitative rating, but between ratings (e.g., a mark between good and average was rated 2.5; between detrimental and seriously detrimental, 4.5).

Principal component factor analysis of the quantified ratings yielded four summary scores: a general score for the first unrotated factor, and a set of three scores for factors obtained in analysis with three rotations. The three rotated factors were tentatively labeled Achievement, Confidence, and Activity Level. Loadings on these three factors and on the first unrotated factor are given below for each of the thirteen behaviors.

	Three Rotated Factors:			Unrotated:
Behavior	Achievement	Confidence	Activity	General
Attention	.822	-.275	.192	.806
Normal activity	.728	-.348	.207	.790
Initiates	.207	-.296	.837	.691
Quick to respond	.380	-.277	.793	.778
Social confidence	.178	-.661	.581	.764
Self-confident	.382	-.769	.184	.785
Comfortable	.309	-.731	.416	.818
Assured	.240	-.800	.344	.778
Persistent	.842	-.201	.220	.790
Reacts to failure	.722	-.444	.163	.821
Eager to continue	.827	-.247	.224	.808
Challenged	.717	-.168	.479	.803
Independence	.548	-.634	.077	.773

APPENDIX Q

ADMINISTERING AND SCORING THE EDUCATIONAL ATTITUDE SURVEY

Administration

During the home interview, mothers were administered the Educational Attitude Survey, a 27-item instrument designed to measure attitudes toward education and toward the public school system. The series of 27 statements was read to the mother, and she was aksed to indicate whether she agreed or disagreed, on a five-point scale: 1= strongly agree, 2= agree, 3= don't know, 4= disagree, 5= strongly disagree.

Specific instructions to the respondent were:

> NO ONE YOU KNOW WILL SEE THE ANSWERS YOU GIVE TO THESE QUESTIONS. THERE ARE NO RIGHT OR WRONG ANSWERS. AS A PARENT YOU HAVE IMPORTANT OPINIONS ABOUT THE SCHOOL THAT WE DO NOT KNOW ABOUT. YOU WOULD BE HELPING US A LOT IF YOU WOULD TELL US WHAT THEY ARE. YOU MAY FIND SOME OF THE STATEMENTS HARD TO ANSWER BECAUSE THEY SEEM SO GENERAL, BUT PLEASE TRY TO ANYWAY.

A sample item was given, with emphasis on the use of the five-point scale in responding. Then mothers were told:

> PLEASE ANSWER ALL THE QUESTIONS AS THEY WOULD APPLY TO THE (CITY) PUBLIC SCHOOLS AS YOU KNOW THEM.

Mothers were encouraged to respond to all items, and were discouraged from using the neutral "Don't know" response except where absolutely necessary.

Educational Attitude Factor Scores

Principal component factor analyses were done on scores for the 27 items in the Educational Attitude Survey. An initial analysis, limiting the number of factor clusters to eight, and a second analysis limiting the number to six, produced essentially the same six factors. Each item had a high loading on one and only one of the six factors, and each factor had three to six high-loading items. The six factors and tentative labels for the major theme expressed by them are:

Factor One ("powerlessness")

Item #25 - Most children have to be made to learn. (.719)
#26 - If I disagree with the principal, there is very little I can do. (.713)
#05 - I can do very little to improve the schools. (.694)
#10 - Kids cut up so much that teachers can't teach. (.545)
#03 - Most teachers probably like quiet children better than active ones. (.482)

Factor Two ("more traditional education")

#8 - Most teachers do not want to be bothered by parents coming to see them. (.667)

(Factor Two)

#11 - Not enough time is spent learning the 3 R's. (.658)
# 7 - What they teach the kids is out-of-date. (.654)
# 9 - Sports and games take up too much time. (.574)
#18 - Teachers who are very friendly are not able to control the children. (.521)

Factor Three ("improvement through education")

#23 - Most kids who can do the work are able to get to college if they really want to. (-.645)
#22 - The most important quality of a real man is driving purpose to get ahead. (-.606)
#16 - The best way to improve the school is to train the teachers better. (-.493)
#14 - The law should be changed so that boys and girls would have to stay in school until they completed high school. (-.456)
#21 - When children do not work hard in school, the parents are to blame. (-.419)
# 2 - The only way that poor people can raise the way they live is to get a good education. (-.368)

Factor Four ("approval of schools")

# 4 - The best way to improve the schools is to integrate them (.575)
#20 - Most teachers would be a good example for my children. (.530)
#24 - A man can often learn more on a job than he can in school. (-.615)
#27 - Most of the teachers are not trained as well as they should be. (-.451)

Factor Five ("irrelevance of education")

#15 - In school there are more important things than getting good grades. (.697)
#13 - People who don't have much education enjoy life just as much as well-educated people. (.591)
#19 - The teachers make the children doubt and question things that they are told at home. (.523)

Factor Six ("disparagement of schools")

# 6 - The classrooms are overcrowded. (-.701)
#12 - There are children in the school I would not want my child to play with. (-.404)
# 1 - The teachers expect the children always to obey them. (-.398)
#17 - Once in a while it should be okay for parents to keep their children out of school to help out at home. (.397)

Educational Attitude Scores

From the six factor clusters obtained in principal component factor analyses of the 27 Education Attitude Survey items, six Educational

Attitude Scores were computed by summing the raw scores on the items comprising each factor, in such manner that a high score represented high agreement with the theme of the factor as labeled.

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